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ALL CLASSES OF INSURANCE TRANSACTED

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ALICE IN POSTERLAND

Drawing by GILROY

Catch as catch can't

"He runs with all his might," panted the Lion, "but I run with might and mane, you know."

"My Goodness," Alice exclaimed, "you *are* fast."

"Your Goodness — *puff* — my dear young lady — *puff* — has nothing to do with it," said the Lion. "It's the Keeper's Goodness I'm after—the Goodness in his Guinness. I haven't the strength to catch him till I've had a Guinness."

"But you can't have the Guinness till you catch him," Alice objected.

"I know," said the Lion. "That's what makes me such a *wild* animal."

G.E.1440.B.

How Radio helps Navigators

by FRANK GEORGE

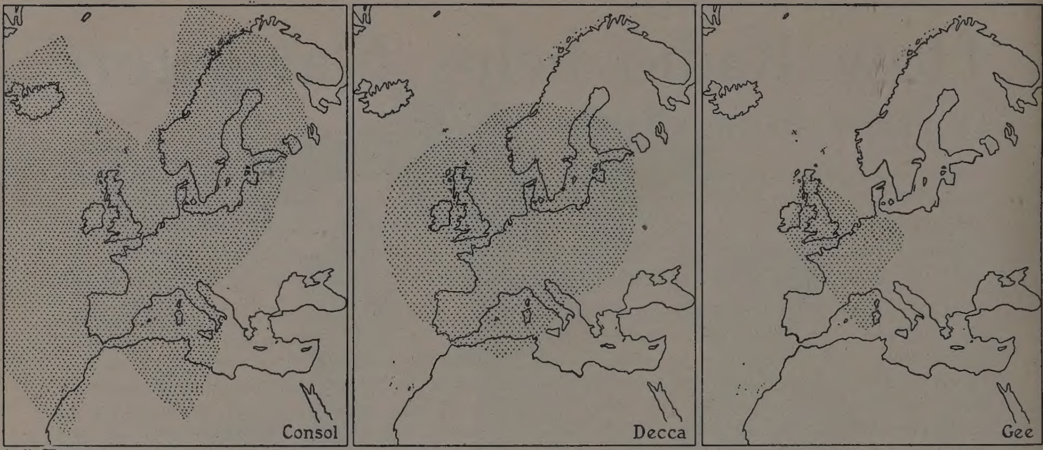
Articles in our June 1946, April 1947 and June 1948 numbers described the methods by which radar is applied to navigation by sea and air; the general framework of radio transmission into which these applications have to be fitted; and some of the geographical problems that are involved and await solution. The present article, by the Assistant Editor of The Geographical Journal, *sets forth the nature, scope and limitations of the radio aids to navigation now in most general use*

The navigation of ships and aircraft requires, above all else, that the navigator should know where he is and which way he must go to reach his destination or avoid danger. Within sight of familiar landmarks this may be a simple matter but when landmarks and dangers are invisible or unfamiliar, a keen look-out is not enough and he depended in the past on dead reckoning, that is to say on keeping an account of the distance and direction in which he had travelled from his point of departure; on the bearing of the land; and on astronomical observations which enabled him to calculate his latitude and longitude—his position on the face of the earth.

The distance at which landmarks are lost to view, even in broad daylight, is generally but a few miles and the account of direction and distance travelled, dead reckoning, must become increasingly unreliable as errors accumulate, whether from the inaccuracy of instruments or from the unperceived effects of winds and currents. It is for this reason that the progress of navigation, far from land across the great oceans, depended on the development of astronomical navigation. But this too has its shortcomings; if the pilot need not have the land in sight, he must be able to see the sky above and both the observations and the calculations that follow take time which can ill be spared in an emergency and still less in the handling of a swift-flying aircraft. The immense value of radio aids to navigation is that by their use the navigator is able to remain in contact with the land even when distance, darkness or the weather have hidden both landmarks and dangers from his sight.

At sea it is perhaps the availability of radio aids in all conditions of visibility that is most significant; they fix a ship's position when no sight of sun or star is possible, and enable it to proceed on its way past dangerous ground and other shipping in conditions that would require a vessel without their aid to anchor or heave-to; they effect a saving of time and make for greater safety. But in the air radio aids do more; for the older methods of navigation are attended with peculiar difficulties; there is neither the time available nor the facilities of a chart-room to tackle the problem at leisure and an aircraft cannot, like a ship, proceed slowly or come to a standstill when it is unsafe to carry on; in particular, aviation is limited by the degree of ability to take off and land in bad weather. The regular operation of large modern aircraft would scarcely be possible without radio aids which, by providing continuous contact with establishments on the ground, inform the pilot of his position, enable him to steer a course on a beacon at his destination, and assist him to approach the runway in the correct direction and at the correct height to ensure a safe landing. In normal flight they provide, almost instantaneously, the assistance the pilot needs and in bad weather their total absence might well spell disaster. In a recent speech Mr Churchill rightly spoke of "radar, the handmaiden of the air". It is not therefore surprising that most of the many radio navigation devices were intended, in the first place, for use in the air and that their use at sea is rather a secondary development: a repayment of the debt which air navigation owes the older navigation from which it has borrowed so much.

The history of the radio aids is almost as old as wireless telegraphy itself for it was soon discovered that a receiver could distinguish the direction from which the signals were coming; and so take a bearing on the distant transmitter, just as one would take a bearing on a lighthouse with a compass, though not with the same accuracy. The next development was the provision of transmitters aligned along important airways so that the pilots of planes could tell whether they were 'on the beam' or not. These were the two forms of radio-aid already in general use before the outbreak of the recent war. As is well known, wartime necessity was the mother of many inventions and from the varied and complex systems that were devised to meet special military needs, a group of navigation aids has emerged that are of



A. J. Thornton

Ships and aircraft can fix their positions by the overlapping pattern of waves transmitted from special stations. The areas covered by the Consol, Decca and Gee systems are shaded on these maps

permanent value to civil navigation and that go far beyond the scope of pre-war direction-finding and airway beams.

The aids now in use fall into distinct types and to appreciate their value and limitations it is necessary to understand something of the principles on which they work. It will be easiest to begin with the older systems already mentioned; they are still of the first importance.

DIRECTION-FINDING

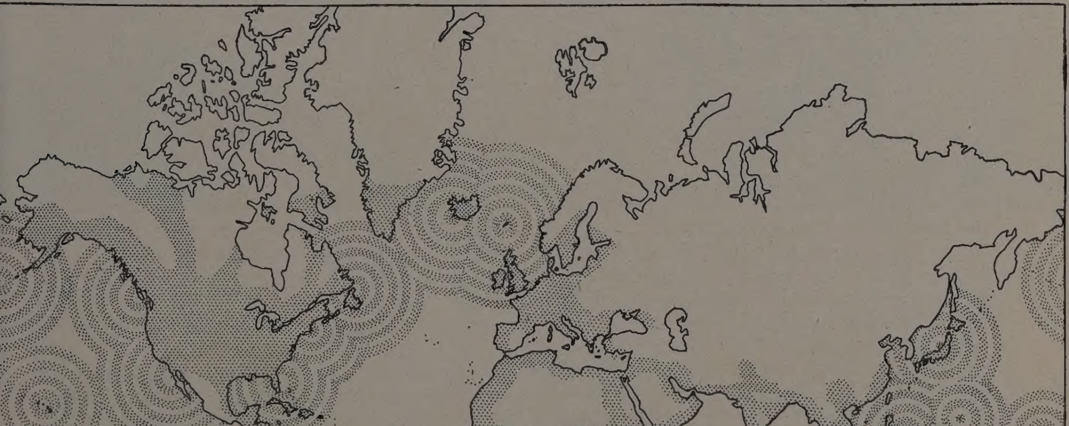
Wireless waves have much in common with the ripples that spread outwards when a stone is dropped into a pond. A cork bobs up and down as the waves go past it; so does a short stick if it floats parallel to the advancing waves. But if it is at right angles to them it pitches backwards and forwards. In the world of radio the difference between a crest and a trough is a difference of voltage; there is no difference of voltage and therefore no electric current in an aerial that, like the stick, is parallel to the incoming wave, but a maximum current in one that is at right angles to it. This is why the direction of transmission can be detected by the varying strength of the signals from an aerial that can be turned round, as anyone who has owned a portable wireless set will know; and, in spite of its various refinements, the direction-finding equipment in a ship or aeroplane does no more than this. Bearings can be taken on any identifiable wireless transmitter and they usually are taken on the stations engaged in communications with ships or aircraft, on the directional beacons that serve most of the overland airways of the world, or on the specially erected radio beacons that mark critical points along the coast and work to a predetermined schedule with more frequent signals in time of fog. The accuracy of the bearings obtained naturally decreases with increasing distance but, from powerful stations, they are usually good up to 300 miles by day at sea; at night, when there are complicating reflections from the upper atmosphere, the limit is about 70 miles. The system is of use in all parts of the world where there are medium frequency wireless stations and by the International Convention for Safety of Life at Sea all ships of 5000 tons and above are required to carry directional wireless. An occasional but valuable use of the equipment is in the location of other ships from which distress signals have been received. The system can be worked in reverse, the bearing of a ship's transmitter being taken by direction-finders on shore and reported in a wireless message. This is perhaps less generally useful, but greater accuracy is possible with land installations more elaborate than those carried on board ship and it is of value in the assistance of aircraft, particularly aircraft in distress.

RADIO TRACK GUIDES

Track guides, as the name implies, are meant not for obtaining bearings but for marking a particular course, along which it is intended that an aircraft should fly. The radio transmission from the beacon is 'beamed', much as the rays of a searchlight are focused, and each beacon sends out two beams, one to the left and the other to the right of the true course. The one beam carries a series of A's in the Morse Code (·–) the other a series of N's (–·) and along the narrow zone where the beams overlap the two signals merge into a continuous note. Thus by listening to the beacon on his earphones a pilot is able to tell at once whether he is on his course or to the left or right of it. This system was very extensively employed in America even before the war and 'radio ranges' mark most of the civil airways of the United States. In Europe its employment has been more restricted though track guide beacons mark the approaches of many airports. A flaw in the system is that the beam is apt to be distorted by peculiarities of the ground in the neighbourhood of the beacon and the signals are affected by 'atmospherics'. An incidental disadvantage is that in poor visibility, when the track guide is of most value, the danger of collision in the air is increased by drawing all aircraft into a narrow lane.

CONSOL

Consol is one of the wartime developments and was devised by the Germans under the name of *Sonne*. It differs in principle from the older aids in that there is a simultaneous transmission from three aerials about two miles apart. The result may be compared with that of dropping more than one stone into a pond at the same time. Each stone will start a series of ripple rings and the rings will overlap and interfere with each other, reinforcing and cancelling each other out by turns. During each transmission period of one minute the three aerials send out a set of 60 dot and dash characters but the number of dots and dashes picked up by the receiver depends on the direction in which it lies from the transmitter. Bearings are obtained by the simple process of counting and no special apparatus is needed in the ship or plane beyond its normal wireless equipment and a chart on which the lines of bearing corresponding to any count have been overprinted. Consol bearings are much more accurate than those given by the old direction-finders and can be taken at a distance of 1500 miles or more. The German stations in Norway and Spain are still in use and a new one has been built in Ireland. A defect of the system is that the pattern of dots and dashes is repeated in each of twelve sectors surrounding the station so that one must first know which



A. J. Thornton

Over the oceans but not over land, Loran enables positions to be fixed. The availability, according to recent information, of beacons or radio range beams along overland airways is also shown sector one is in, though this is not usually in doubt and can be resolved by using the Consol station itself with an old-fashioned direction-finder. There are two rather wide 'blind' sectors, along the line of the masts, within which no bearings can be taken.

DECCA

Like Consol, the Decca system depends on simultaneous transmission from more than one aerial, but here the aerials are many miles apart. The same analogy of ripples applies, but the transmission is continuous and not broken up into series of dots and dashes. What the receiver undertakes is to find where two waves reinforce each other or cancel out or, at any point, the extent to which they are out of step—the 'phase difference', to use a technical expression. This phase difference depends on the difference between the lengths of the two paths traversed by the waves from a pair of transmitters and the same phase difference is found all along a certain curve passing over the earth's surface. The receiver, or Decometer, by its readings identifies this line; it is not a bearing, as in Consol, for the line is curved and is in fact a hyperbola. To complete a 'fix' the intersection of at least two such lines is required and Decca transmitters are arranged in chains of three so that any two of them, taken as a pair, define one line. The Decometer is a highly specialized form of receiver and its indications are shown on three dials where pointers, like the hands of a clock, mark numbers that correspond to the numbered lines overprinted on a chart. As in Consol, an ambiguity arises from the identification numbers repeating themselves in each of a series of 'lanes', but a further recent refinement of the system provides for lane identification. The Decca system is extremely accurate up to distances of 200 or 300 miles and, although it requires the use of the special Decometer receiver, is equally applicable to sea and air navigation. A Decca chain with its stations in England was established during the war and a second chain has very recently been set up in Denmark. In addition to its value in navigation, its extreme accuracy and continuous indication make it suitable for the control of air surveys and temporary transmitters have been set up for this purpose in Greenland and the Middle East.

GEE

The Gee system was one of the great successes of the war for it was the main navigation aid for most kinds of aircraft and ships in the invasion of Normandy. In its pattern of hyperbolic curves it closely resembles Decca but operates on an essentially different principle. Where the Decometer infers the difference in path length to two stations from the overlapping of the waves, Gee measures the same difference more directly by timing radar pulses. The alternate radar pulses from a pair of stations reach the receiver, not at the same intervals as they started out, but displaced in time to an extent which depends only on the difference in path and, although this difference is but a few millionths of a second, it can be measured—and measured accurately—with that new instrument of science the cathode ray oscillograph, more familiar to most people as the 'tube' of a television set. The cathode ray traces a line of light across the screen as it is deflected in the tube by varying electric and magnetic fields and the incoming pulses from a Gee transmitter form a permanent kink in the trace. The almost infinitesimal time-lag appears as a shifting of the kink towards one side of the tube and the path difference is measured by setting the electrical controls to 'line up' the two kinks that represent transmissions from a pair of transmitters. The numbers obtained by this process of lining up indicate the numbered lines on the Gee chart. Its great accuracy at moderate distances made Gee invaluable for service use; it continues to be a valuable aid, particularly in the air, and chains of stations exist across Europe. Its chief limitation is that, because it employs very short waves, its range is limited to about 200 miles for aircraft flying at 5000 feet and to about 100 miles for ships.

LORAN

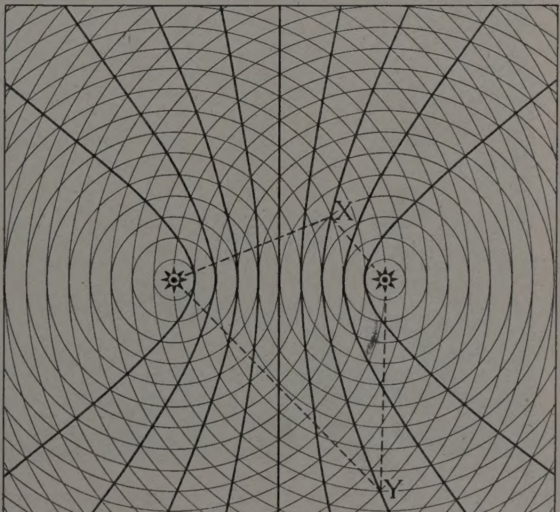
Loran differs little either in principle or in the presentation of its indications from Gee, but, employing a much longer wave-length, its range extends to 1200 miles over the sea at night. The range is less by day and over land it is of little value. Loran is pre-eminently an aid to trans-ocean navigation both by ships and planes and, developed during the war by the Americans, it now provides a chain of stations covering the North Atlantic and North Pacific.

SHIPBORNE RADAR

Here we come to radar proper, the 'magic eye'. It too is a wartime development and first came into prominence as a means of detecting enemy aircraft that approached

By courtesy of Decca Navigator Co., Lt

The overlapping pattern of waves from two Decca transmitters resembles ripples on a pond. At X in the diagram one is exactly 8 wavelengths away from one station and 4 wavelengths away from the other. The same difference (14 minus 10 at Y) will be found anywhere on the curve XY. Some other constant difference will be found along each of the other curves. The dials of the Decca receiver enable the navigator to tell which curve he is on and the Decca chart is printed with a lattice of coloured curves. One of the dials and one of the colours relates to each of the pairs of transmitters



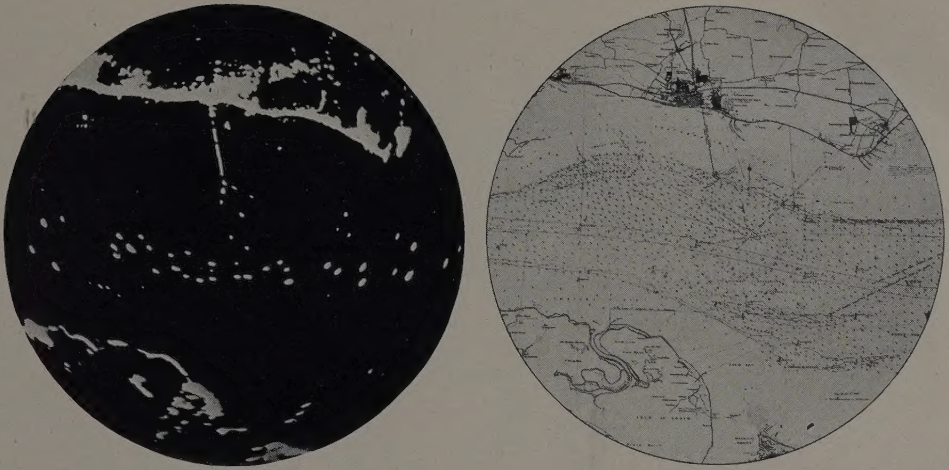
these shores. The principle is that of radio echoes; when a pulse of very high frequency radiation is sent out, a minute fraction of it is reflected from every obstacle in its path and the reflected energy can be detected when it returns to the transmitter. As in Gee and Loran there is a time-lag of a few millionths of a second between the transmission and the returning echo which measures the distance of the echoing object; and if the outgoing transmission was beamed in a particular direction, that must be the direction in which the object lies. As in Gee and Loran, the result is displayed on a cathode ray tube; but the spot of light that marks each echo is made to appear at a distance from the centre of the picture that corresponds with the time-lag and in the direction from which the echo comes. The picture on the face of the tube is, in fact, a *map* of the obstacles encountered by the beam. The development of the system was rapid; from ground installations for detecting the presence of aircraft there followed airborne sets for spotting hostile aircraft and ships and it was soon discovered that the echoes of land that they revealed were in themselves an aid to navigation. It was used in bombers to provide a map of the ground below the plane and in invasion landing-craft for the identification of the coast of Normandy in darkness.

In peace, the weight and complexity of the apparatus has limited its use in the air, but it has become of immense importance at sea. The ship's radar has a rotating aerial on a mast which 'scans' the whole horizon and the cathode ray tube is a Plan Position Indicator (P.P.I.) on which everything appears that is within the scan: land, buoys and vessels. The range at which objects can be picked up does not greatly exceed the distance at which they can be seen by eye, for the very short waves that must be used to secure sharp echoes behave like light waves and do not bend round the curve of the earth's surface: but they penetrate fog and darkness and even in broad daylight they provide a *plan* of the land which is often of more value than a direct view of a featureless shore. The greatest value of the aid is in fog when landmarks and channel-marking buoys can be picked up and a pilot may feel his way in narrow waters and avoid collision with other vessels. Besides the greater safety that it provides there is an immense saving in time and money to ships so equipped when fog would otherwise keep them at anchor or add to the congestion in a port. It has been estimated that about 300 ships are now being fitted with radar every year, in this country alone. A harbour supervision radar has been installed to watch and guide the shipping in the foggy approaches of Liverpool Bay and a second installation in the same area has been of immense benefit to the Mersey ferries.

Though its peacetime use in the air is more restricted radar is used in a simpler form as a cloud and collision warning device, for

By courtesy of Marine Instruments Ltd.

Radio aids on a modern trawler. Immediately ahead of the trawler's funnel is the rotating scanner of the ship's radar. In front of that are the crossed hoops of the direction-finding aerial



By courtesy of Marine Instruments Ltd. *See credit at foot of page*

Radar provides (left) *a plan of Southend and Southend Pier to compare with the chart* (right) *and reveals fog-bound shipping in the Thames. The observer's position is at the centre of the circle*

thunder clouds are a major danger and show up well on the radar screen.

AIRCRAFT LANDING AIDS

It has been said already that modern aviation is largely limited by the ability of aircraft to land safely in darkness and bad weather and there is a host of radio aids in use at airports to meet this particular need. Some of them are purely 'radar': the aircraft is 'seen' as it approaches and directed by telephone from the ground, or the pilot picks up a landing-beacon and directs his flight towards it. Others are short-wave refinements of the older directional wireless and track guides, operated from the ground or by the pilot himself. In one form or another they are installed at all the major airports of the world.

Such are the aids to navigation by sea and air that radio science has placed in the hands of the navigator. It is remarkable that so many of them should have been developed for the special needs of war and indeed there are many others whose application to civil use has, so far, been less evident. It is significant too that the recent advances have been so closely linked, in their inception at least, with the needs of aircraft, the need for the pilot of a fast-moving machine to maintain constant touch with the ground from which he has risen and to which he must descend in safety at his destination.

How far do the new aids affect the conduct of navigation? At sea, directional wireless provides the navigator with bearings to the land at moderately great distances wherever there are transmitting stations that he can pick up. Decca gives him position lines off the coasts of northern Europe and Loran in the North Atlantic and North Pacific—if he carries the appropriate equipment; Consol in the North Atlantic with no other apparatus than a wireless receiver. Seaborne radar, in fog and darkness, enables him still to see his way and avoid danger. In distress, coastal stations can find him and direct him to safety or bring others to his assistance.

In the air, the 'position line' systems are equally available if the aircraft is equipped with the necessary apparatus and bearings can be taken on wireless transmitters. The pilot can direct his flight by track guides and beacons on the established routes where they are provided and, as he approaches his landing, he can align his plane on an unseen runway, or place himself in the hands of a ground controller to be watched and shepherded to the ground.

Yet it must not be supposed that the time-honoured ways of chart work, dead reckoning and astronomy have now been superseded. The navigator cannot lean wholly on instruments that link him with wireless stations on land. In many parts of the world they are not available and in most cases their indications would be of little use for the conduct of the vessel if he failed to keep a strict account of his course and progress and to use every appropriate means, old or new, to fix his position.

Admiralty chart reproduced above (right) by permission of the Controller of H.M. Stationery Office and the Hydrographer of the Navy

Contrasts in Bulgaria

by J. ALLAN CASH, F.I.B.P., F.R.P.S.

We make no apology for publishing, at a time when relations with the Bulgarian Government are strained, an account of a recent visit to Bulgaria by a contributor well known to our readers. Mr Cash did not see everything; but he saw and photographed what he wished; and if the resulting picture is not the one customarily presented to us, it shows that on the other side of the 'Iron Curtain' there are people for whom many of today's conditions are a great improvement on the past

I have visited Bulgaria twice during the last dozen years—first in 1937, under the Boris dictatorship, and again in 1948, by which time Bulgaria's old rulers had been thrown out and a left-wing, virtually Communist, form of government had been adopted. Needless to say, there were many contrasts to be seen, some very obvious, others not so easily noticed at first. Both my visits were fairly lengthy, the first lasting some three-and-a-half months, the second about five weeks. In each case I travelled widely throughout the country, in town, village, mountain and farmland. Both times I took hundreds of photographs of everything that interested me.

Perhaps a brief survey of recent Bulgarian history would make for a better understanding of conditions in that little Balkan country today. One of the great dates—perhaps the greatest—in Bulgarian history is 1878. In that year Russia, under Tsar Alexander II, set out to liberate Bulgaria and other parts of the Balkans from the Turkish yoke. For five long centuries the Turks had ruled Bulgaria, stifling liberties and religion, endeavouring to make the Bulgars servile subjects of the Ottoman Empire. Nevertheless the spark of Bulgarian culture, along with the yearning for freedom, never died. In 1878 they blossomed forth again, and ever since then, regardless of political changes, the Bulgarian people have always considered the Russians as their big brother Slavs, as their liberators.

Great monuments were erected on the Shipka Pass, to the victory and to the Tsar. A fine statue was raised in Sofia, in the square opposite the Parliament Buildings, and the main street which runs through it was named the Tsar Liberator Boulevard. It is still called so today and the name will doubtless not be changed.

This warm feeling towards Russia survived the Bolshevik Revolution of 1917, and was so strong during the recent war that even Hitler could not persuade the Boris government to declare war on the Soviet Union. Bulgarian troops did police duties in Yugoslavia and elsewhere, but they never fought on the Russian front. Many Bulgarians secretly revolted and formed themselves into bands of partisans to harass the Germans. Hundreds of them died, and with them a British officer—Major Frank Thompson—whose name is revered in Bulgaria today.

Thus it will be seen that the overthrow of their wartime government by the people of Bulgaria on September 4, 1944, when the Nazis had gone, was only to be expected. The Bulgarian forces, in fact, did a creditable job of work in the Allied cause in the closing days of the war, fighting their way against our enemies far up into central Europe. Georgi Dimitrov, the old Bulgarian bolshevik, on whom the Nazis utterly failed to pin the blame for the Reichstag Fire in 1933, was the natural leader for the new Bulgaria, and, until his recent death, Prime Minister.

One of the unchanging things I noticed in Bulgaria was the love of pageantry and demonstrations on the part of the people. While I was there in 1948 a Treaty of Friendship was signed between Bulgaria and Hungary. The Hungarian Premier, Foreign Minister and other members of the government visited Sofia and the people turned out in their thousands to give them a great reception. The climax was one evening when Dimitrov, Kolarov, the Foreign Minister, and the Hungarians made speeches to an enormous crowd in front of the Council of Ministers, formerly the Royal Palace. In 1937 I was in Sofia when the Crown Prince was born to the King and Queen. Great crowds turned out then and came from all parts of the country, carrying gifts of every kind for the royal family. The government of the day organized free trips to Sofia for the peasants, and the people were not slow to seize the opportunity of an outing.

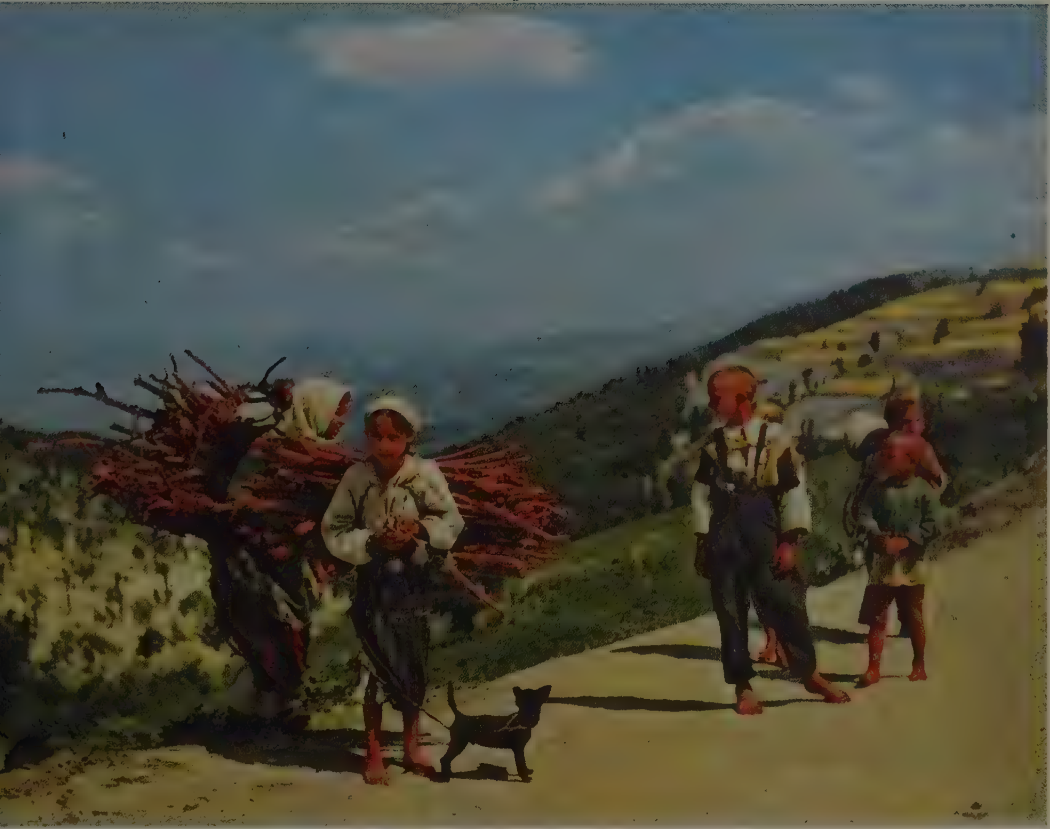
Something new I noticed immediately upon arriving in Sofia last year was women directing the traffic. Smartly dressed in brown skirts and white coats, with peaked caps, they took their duties very seriously. Previously the activities women could follow

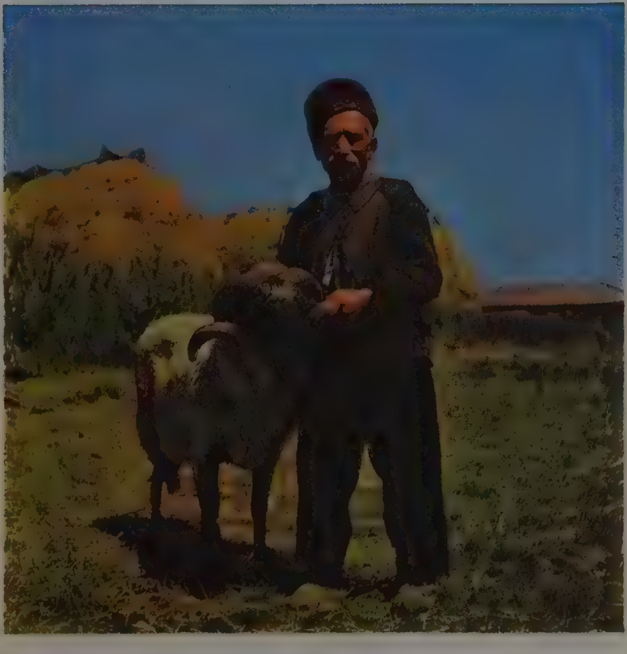
All Anscocolor photographs by the autho

In the Park of Liberty at Sofia, formerly the Boris Park, is a group of swimming-pools. Completed in 1939, they are a centre for large numbers of townsfolk during the hot summer months. Sunday is the great day, when whole families and parties of people spend the day there, complete with bathing suits, books and toys

(Left) *The Partisan Monument in the Park of Liberty at Sofia, with its beautifully kept flower-garden, was erected in honour of brave men and women who fought the Nazis and the pro-Nazi Bulgarian Government during the war. The Bulgarian people were never pro-German as a whole, and Bulgaria did not declare war on the Soviet Union. All over the country there are monuments, cairns and stones marking the places where partisans were killed*

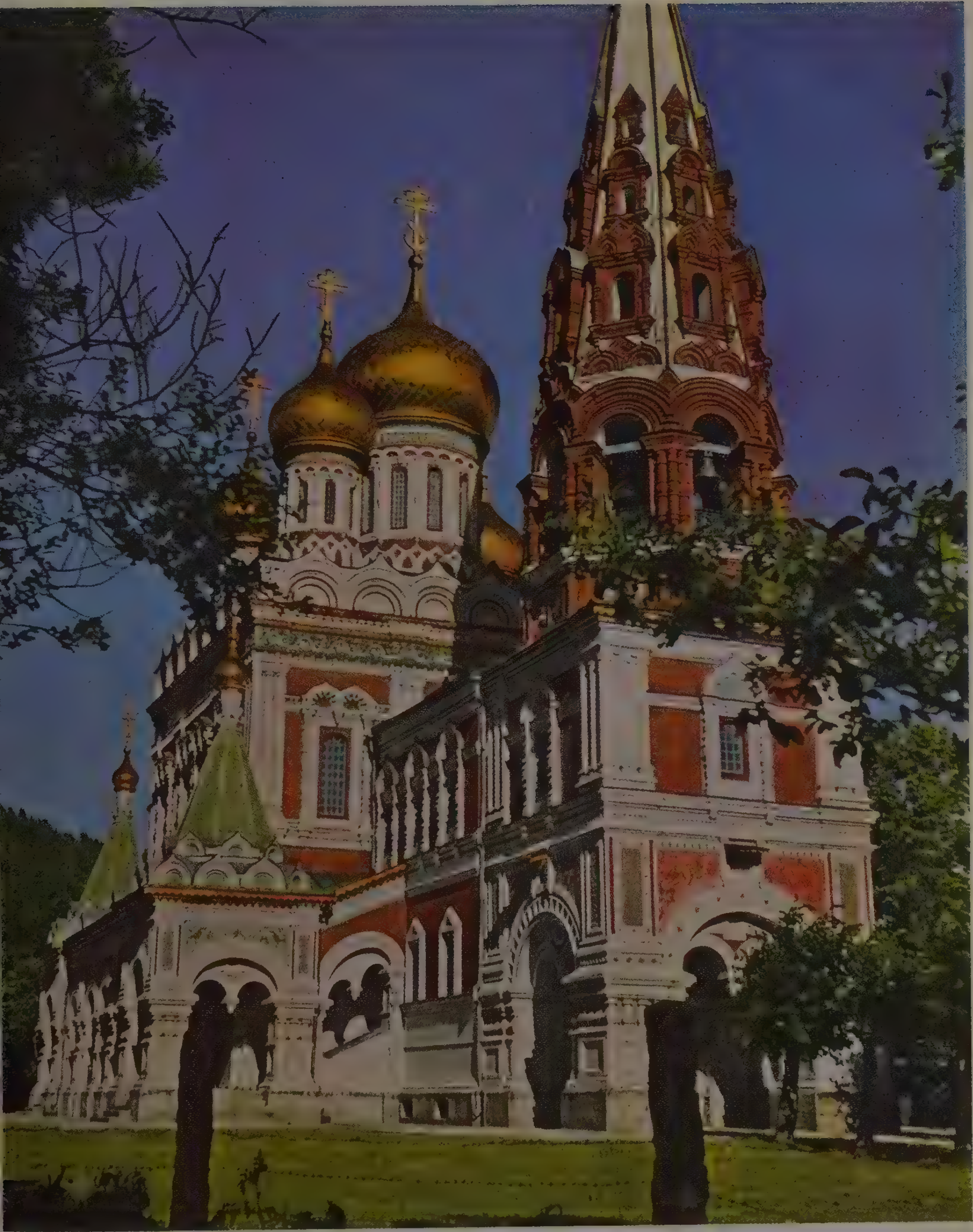
Nearly every great occasion in Sofia was an excuse for Premier Georgi Dimitrov to address a large crowd from the balcony of the Council of Ministers. This building was formerly the Royal Palace of King Boris, but the gardens in front of it have been cleared away and replaced by a broad open square. (Right) *Dimitrov speaking at a meeting to celebrate the signature of a Treaty of Friendship between Hungary and Bulgaria. Bulgarians had a great affection for the man who reduced Goering to impotent rage and successfully defended himself against the charge of setting the Reichstag building on fire*





(Above) *It is a far cry from the former Royal Palace to the Rhodope Mountains, where dwell the Pomaks, descendants of Bulgarians who became Moslems in Turkish times. Though probably still the most backward community in Bulgaria, they are conscious of being less neglected and are building new houses and schools. Prospects have changed even more for* (right) *such a man as Doycho Stanchev, who after spending many years in America has now returned to his native land and is in charge of the sheep on a new and prosperous cooperative farm, one of hundreds formed with government backing*

The Bulgarian Orthodox Patriarchate was established in A.D.*927. A priest (or "pope") must be married before he can have a church of his own. Priests work in the "brigade movement": more than a thousand did so in 1948.* (Above) *A priest returning with his wife and daughter from a Sunday walk on Mount Vitosha, where the brigades are building a new road. The social duty denoted by his informal dress is quite compatible, in Bulgaria, with that symbolized* (right) *by the splendid vestments of "Pope" Georgi Bogdanov, here seen in his church near Sofia. Pope Georgi is a prime mover in the priests' brigades, and each year does his month with pick and shovel*



Perhaps the greatest date in Bulgarian history is 1878, when the Russians, under Tsar Alexander II, poured over the Shipka Pass in the Balkan Mountains, to release Bulgaria from the Turkish yoke. After the victory the Russians erected this beautiful church in the village of Shipka and presented it to the Bulgarian people

Some forty miles south of Sofia lies the great block of Rila Mountains, with densely wooded slopes and snow-covered peaks. Out of the mountains comes the lovely Rila River. Far up the valley lies the famous Rila Monastery, where the spark of Bulgarian culture was kept alive during the five centuries of Turkish rule in Bulgaria had been restricted. Bulgarian women are proud of a member of their sex who is Minister of Posts, Telephones and Telegraphs. She is Tsola Dragoicheva, and she has a fine record for partisan work during the war.

Another innovation which could hardly remain unnoticed for long by a visitor to Bulgaria is the "brigade movement". I frequently saw, and heard, truck-loads of young people driving through Sofia and other towns singing their catchy brigade song. Young people, for the most part, devote a month of their time each year to working on some public project. I found them in groups working on a new railway, on new roads, and hundreds of them were helping to build a great new dam at Rositza. At Karlovo I came across a Sunday brigade of local citizens busy at work transforming their formerly rough and untidy town square into a thing of orderliness and beauty, with flower-beds, trees and an elaborate marble fountain. I also came upon groups of priests at work with pick and shovel, obviously enjoying the change from their ecclesiastical duties. The work done in this way enables the various projects to go ahead very rapidly. It helps to compensate for lack of machinery and it undoubtedly creates a fine spirit of unity and determination among the people.

Women have entered into the brigade movement with every bit as much enthusiasm as the men. Their dress is usually a 'sporting' minimum of shirt and shorts. Other women, however; look just the same as in former years: peasant women in their home-made costumes, spinning wool by hand as they walk along the dusty roads. Often the two would mix as country folk stopped to watch the work going on in their vicinity.

The peasants in Bulgaria have for many years been very poor. Their farms were, on the average, barely capable of supporting a family. As far back as the 1930s a law was in force forbidding any further division of land, and measures were being taken to improve the lot of the peasant farmer by introducing new and more profitable crops. A start had been made in the cooperative movement among the peasants, but it was not greatly encouraged. Today the opposite is true. Every help is being given to form and run cooperative farms. Whereas previously they were numbered barely in tens, today there are about 1600 cooperative farms throughout the country. The contrasts they are creating are most striking. Much of the back-breaking human toil is going. Threshing is being done by machinery instead of the trampling feet of horses, oxen or buffaloes. The wooden plough which scratches the earth so lightly is being outpaced by three-, four- and five-furrow steel ploughs drawn by powerful tractors. The distant hum of machinery over the Bulgarian farmlands is now becoming a commonplace rather than a rare novelty.

But machinery is not the only change brought about by cooperatives. New buildings for both animals and human beings go up with surprising rapidity. One cooperative I visited near Plovdiv had all the appearance of a huge, well-planned agricultural institute. Yet only three years ago the members were all individual peasant farmers, scratching a bare living from their little plots of land. It was the poorer peasants who had joined the cooperative. But after only three years some of the richer peasants were wondering about the idea as well; for not they but the members of the cooperative were building new houses, buying radio sets and new furniture. This was a contrast which could be seen over and over again wherever I went in Bulgaria, and it was something fundamental in a backward peasant country.

Among the Moslems of Bulgaria there were some interesting contrasts to be seen. There are well over half a million Turks living widely scattered in Bulgaria. One sees their mosques everywhere, including Sofia, for despite religious persecution during Turkish times, the Bulgarians since their liberation have never interfered with the observance of Islam. My experiences in a rich Turkish home at Krichim, some twenty miles from Plovdiv, illustrate what is happening among these people. First we were welcomed in and given sweet cakes, for it was the festival of Bairam. Then I was permitted to take photographs. There were three generations of women there. The old grandmother wore the familiar black Turkish clothes and was veiled. Her daughter also wore traditional black dress but she had no veil. *Her* three daughters, two of them married, wore smart western dress with no suggestion of a veil. Similarly among the Pomaks, the Moslem Bulgarians. In 1937 I tried in vain to photograph a Pomak woman. Without exception, heavily veiled, they ran from my camera. Last year I found many without the veil, and even some still veiled who posed for pictures.

Finally, a welcome contrast to me was the improvement in many of the roads. Balkan roads had to be seen to be believed, but today many of the main roads in Bulgaria are quite good. Dusty or muddy, yes, but much smoother. Bulgaria needs a hundred ship-loads of asphalt.

The Men behind Modern Geography

I. Sir Joseph Banks

by G. R. CRONE

Since 1945 we have published a large number of articles designed to illustrate the "Fresh Fields for Geographers" of which Lord Rennell wrote in our December number of that year. "How," certain readers have asked, "did the modern concept of geography arise; and who were the men who gave it shape?" The Librarian of the Royal Geographical Society attempts to answer this question for us in a series of short articles, of which the following is the first, on some of the geographers most concerned. (Right) *Sir Joseph Banks, by Thomas Phillips*

After a portrait in the possession of the Royal Society. By courtesy of the Linnean Society

The century from 1760 to 1860 witnessed a great expansion of European knowledge of the world comparable only to the great age of discovery which opened modern history. In that period the exploration of the great oceans was completed, and the main interior features of the continents were revealed. British explorers played a conspicuous part in this work, which may be regarded approximately as opening with Cook's first voyage and closing with Livingstone's death in Central Africa. These voyages and journeys revealed to Europe a fascinating variety of lands and of peoples in all stages of development, and the mass of newly-acquired facts transformed radically the long-established science or art of geography. The nature and effect of this impact can be traced most conveniently by examining the work and thoughts of the acknowledged leaders of the 'new' geography.

By the 18th century, geography, which had a respectable lineage going back at least to Greek and Latin authors, had fallen into decline. To a large extent it had become subsidiary to history on the one hand and to politics and commerce on the other. Compendious works of general geography, introduced by a mathematical section leading up to 'the use of the globes', were filled with discursive commentaries on classical topography, detailed analysis of contemporary political divisions, and lists of cities, ports, commercial products, and exports, uninspired by any unifying and vitalizing concept. The allied sciences—geology, meteorology, botany—which were later to make their various contributions to the reformed geography were, however, progressing notably as part of the general scientific movement which substituted accurate observation, the orderly arrangement of facts, the tracing of cause and effect, and the formulation and testing of hypotheses, for *a priori* argument and traditional lore. In cartography, improvements in instruments and technique were also opening the way to the perfection of the geographer's characteristic tool, the accurate map of the earth's surface features. But there was still a vast amount of hard facts to be accumulated by explorers and travellers before a reasoned outlook on the geographical environment could be formed.

The voyages of Captain Cook form a convenient starting point for a study of modern geography, for there are links with some of the outstanding names of the early days. It was the younger Forster, naturalist on the second voyage, who inspired Humboldt with his passion for the beauties of natural scenery, and many of the navigators who carried on the work of exploration acquired their skill in the hard school of Cook. But one name in particular is inseparably linked with Cook's—that of Joseph Banks.

Banks represents one type which has done much for geography, particularly in Britain: the man of standing and influence with wide-ranging interests, prepared to back the man in the field. In his case, as in that of others, distinction in an allied science was added, for his name stands high in the annals of botany.

The son of a wealthy landed gentleman, Banks displayed from his earliest years a passion for botany, and great determination in achieving his aims. While at Eton, he was attracted by the wild flowers in the country lanes, and commenced his studies by persuading the women who collected simples to bring him specimens for a small fee.

Going up to Oxford, determined to continue his botanical studies, he was unable to find a qualified instructor in the University. Nothing daunted he persuaded Israel Lyons, an astronomer and botanist, to migrate from Cambridge, and to provide the necessary instruction. On his father's death, he established himself in London as a patron of the sciences in touch with court and official circles. Banks had a capacity for making and keeping friends, partly because he never forgot a favour, and never abandoned anyone to whom he had given his confidence. This characteristic tempered his otherwise autocratic demeanour. With his private means he was able to pursue his studies far afield. His first essay was to spend the summer of 1766 botanizing in Newfoundland and Labrador, and laying the foundations of a flora of that region. Two years later, a great opportunity arose, which he was quick to seize. With the support of the Royal Society, he obtained permission from the Admiralty to accompany Cook in a private capacity on the voyage of the *Endeavour* to Tahiti for the observation of the transit of Venus. He organized and equipped at his own expense a party for botanical investigations, which included Dr Solander, an eminent botanist, and four artists for recording their finds. His total outlay was said to have reached £10,000. The *Endeavour* sailed in August 1768.

It is unnecessary to recapitulate all the details of the voyage. After a stay of three months at Tahiti, Cook sailed southwards to test the theory of a great southern continent, completed the exploration of the New Zealand coastline, and charted for the first time the eastern coasts of Australia, before returning through Torres Strait.

In London again, Cook and Banks found themselves popular heroes. One fervent admirer refers to Banks' reception as a "Roman triumph". Dr Hawkesworth, an eminent moralist, was entrusted with the task of preparing for publication the narrative of the *Endeavour's* voyage, with those of earlier circumnavigators; Banks, without apparently any obligation to do so, placed his own journal at Hawkesworth's disposal. The result is a mixture of Cook and Banks rewritten and embellished with suitable moral sentiments by Hawkesworth. There is little doubt that this procedure disguised to some extent the true part played by Banks on the voyage. The publication over a century later of the two original Journals allowed a more just estimate to be formed. Though his position was entirely unofficial it is clear that Banks contributed much to the success of the voyage. In particular he was adept at establishing good relations with the native peoples, taking the trouble to learn as much of their languages as was possible in the time. He was also the most successful, through a combination of firmness and sympathy, in securing the return of objects stolen by the natives. Practically the only criticism he makes of Cook was on an occasion when he considered his action towards the natives was ill conceived and too harsh. Banks' Journal gives a remarkably detailed and sympathetic account of the people of Tahiti and New Zealand, though he naturally missed the significance of some of what he records. His observations otherwise are mainly botanical and zoological, but he touches on such topics as the volcanic formation of islands, the effect of altitude on vegetation, and the general nature of the countries visited.

Banks made extensive preparations to accompany Cook on his second voyage, but friction developed with the Admiralty, and the amount of accommodation he required appears to have been too much for the *Resolution*. Rather than waste the preparation already made, he characteristically chartered a vessel and set off with his party for Iceland. *En route* he examined and described in some detail the basaltic columns of Staffa. In Iceland, they made extensive investigations and achieved the first recorded ascent of Mount Hecla.

Banks was now securely established in London as the leading scientific authority and adviser to Government, a position consolidated by his election as President of the Royal

Society in 1778, an office he held for forty-three years until his death. His house in Soho Square, where his collections and extensive library were housed, became almost the nucleus of a learned society, frequented by scientists, British and foreign. Of great significance was his continued support of exploration. He was the founder and first secretary of the committee which directed the Association for the Exploration of the Interior Parts of Africa, formed in 1788 and ultimately absorbed into the Royal Geographical Society. It was through him that Mungo Park received the support of the Association and set off with a draft for £200 in his pocket on his first attempt to solve the problem of the Niger, and he secured government support for Park's second journey in 1805. His interest also ranged as far as the Polar regions: the voyage of the *Endeavour* had done much to demolish the theory of a great southern continent, but Banks had correctly conjectured that a much smaller antarctic land "situated in very high latitudes" must exist, and expressed the opinion that a voyage for its exploration should be promoted by the Royal Society. This project had to wait sixty years for its final consummation but Banks had a share in the despatch of Phipps' Arctic expedition of 1773 and, late in life, of Parry's voyage for the North-west Passage. Nor was Asia neglected; among his services there was his action in persuading the East India Company to allow Thomas Manning to travel in Tibet, and thus to be the first Englishman to reach Lhasa.

But it was to promote the exploration and development of Australia that Banks' influence was most continuously exerted. Much has been made of the apparent change in regard to the potentialities of eastern Australia which his views appeared to have undergone between the discovery of Botany Bay in 1770 and his advocacy of the establishment there of a penal settlement in 1779. It is true that he noted the sterile and barren nature of the land, and could only say for it that it might support a shipwrecked party, but elsewhere he appears to be referring only to the coastal stretches and did not consider that these conditions were universal. In advocating the sending of felons to New South Wales rather than to the West African hulks, it cannot be said that his instinct was at fault.

With the establishment of the settlement at Port Jackson, Banks became in effect its unofficial representative in London. He threw himself whole-heartedly into the preparations for Matthew Flinders' voyage on the *Investigator* which filled in most of the remaining gaps in knowledge of Australia's outline, and drew up the scientific programme. Through his influence, Robert Brown, "*Botanicorum Princeps*", sailed with Flinders, with the result that extensive strides were made in the knowledge of the plant life of Tasmania and eastern Australia. Nor were geology and other branches of knowledge neglected. Banks also pressed for the exploration of the interior; realizing that the settlement must eventually become self-supporting, he hoped that further investigation would reveal "some native raw material of importance to such a manufacturing country as England is". On the political side, Banks acted as an unofficial link with the Colonial Office, for he was fully informed of events through his constant correspondence with the early governors from Admiral Philip to Bligh. The latter was one of his protégés, who had been put in command of the *Bounty* on her voyage to introduce the bread-fruit tree to the West Indies from the Pacific—another project initiated by Banks.

In addition to promoting exploration in all parts of the world and fostering the Australian settlement, Banks also encouraged the advance of knowledge in other ways. His fine library was available to men like Burney, the compiler of the monumental *Voyages and Discoveries in the South Pacific Ocean*. In this heavy task he was actively encouraged by Banks, who also supplied him with material for incorporation, particularly a translation of the journal of Tasman's first voyage. He was also a friend and colleague of Major James Rennell, one time Surveyor General of Bengal, whose interests and labours ranged from surveying to classical topography and oceanography.

Much of the work that Banks was able to do for the advancement of science was possible through his position as President of the Royal Society, and it was natural that he should be jealous of its position and prestige. This attitude led him to oppose the establishment of distinct Societies for the cultivation of individual sciences. The foundation of a Geographical Society was thus delayed until after his death. For his part it can be said that the attitude of his time favoured the unity of science, and that geography as an independent discipline had yet to emerge. Banks made a great and enduring contribution to that "broad foundation of precisely recorded facts" upon which geography was to rise. The synthesis of such facts into a reasoned system was the work of Alexander von Humboldt.

Beanstalk Land above the Clouds

Eritrea, as the Traveller sees it

by E. F. WISE

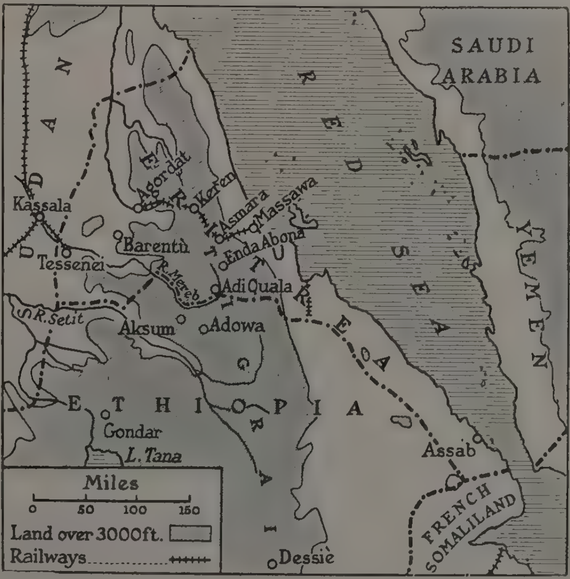
Among Italy's former colonies, on the disposal of which the United Nations Assembly has failed to agree, is Eritrea. The author served there until recently as District Officer with the British Military Administration, in which capacity he came into close contact with the local population

THEY say in Massawa that their summer is too hot even for flies to survive. And this is easy to believe if you land there between June and September. The little port is pleasant enough, set against the burning blue of the Red Sea—sorry, but the Red Sea *is* burning blue—the floating emeralds of Nokkra and Green Island in the foreground. Nowadays, large ships anchor in the roadstead instead of coming alongside, for the harbour is gradually silting up. This is the first visible sign of the narrow limitations imposed upon the British Administration which controls Eritrea on a half-hearted "Care and Maintenance" basis until such time as the fate of the former Italian colonies has been determined at Lake Success.

The town of Massawa, Arab in character, is inhabited by a mixture of the Samhar and Saho tribes, with a sprinkling of jet-black Danakils. Ethiopia claim to this port is purely economic. Racially, there is no sort of connection with the Abyssinian world and Massawa never at any time formed part of Ethiopia.

A white diesel coach is waiting in the station. The excellent Italian-built road and rail communications with Asmara, the capital, are a prodigious feat of engineering in what must be some of the most difficult terrain in the world. The coach glides smoothly away, past the heavily latticed verandahs, gathering speed as it goes along the causeway across the lagoon between Massawa and the mainland.

So this barren sand which receives us on the far side is Eritrea? No, it isn't, though it is fairly typical of the Eastern Lowlands. It lies under the equatorial sun, empty as a lunar landscape. The railway crosses a few dry wadis and, after about twenty miles of desert, begins to climb. The first surprise comes at Dongollo where the thickly wooded hills, dry like brown paper now, will look during the rains as green and lush as Surrey. Up and ever up wind the rails, till you land in the green cup of Ghinda Valley with its pleasant little town and Italian fruit-farms nestling at the foot of a range of dark mountains. It looks hardly possible for your coach to negotiate so formidable a barrier but it noses its way gallantly round the sides of the precipitous slopes till it reaches the top.



A. J. Thornton

The top? A dark cloud hangs high in the heavens as the coach draws into Nefasit,

ns Leuenberger

Hans Leuenberger

(Above) *Massawa is the larger of Eritrea's two ports. In Italian times its turnover was vast and even now it handles half a million tons per annum. The war has left its traces, for Italian and German wrecks still raise their dismal funnels and masts above the water.* (Below) *The Railway runs from Massawa to Asmara, on the Plateau, and the Western Lowlands. Built by the Italians (1887 to 1928) it climbs 8000 ft in seventy miles and carried half a million passengers in 1948*

Hans Leuenbe

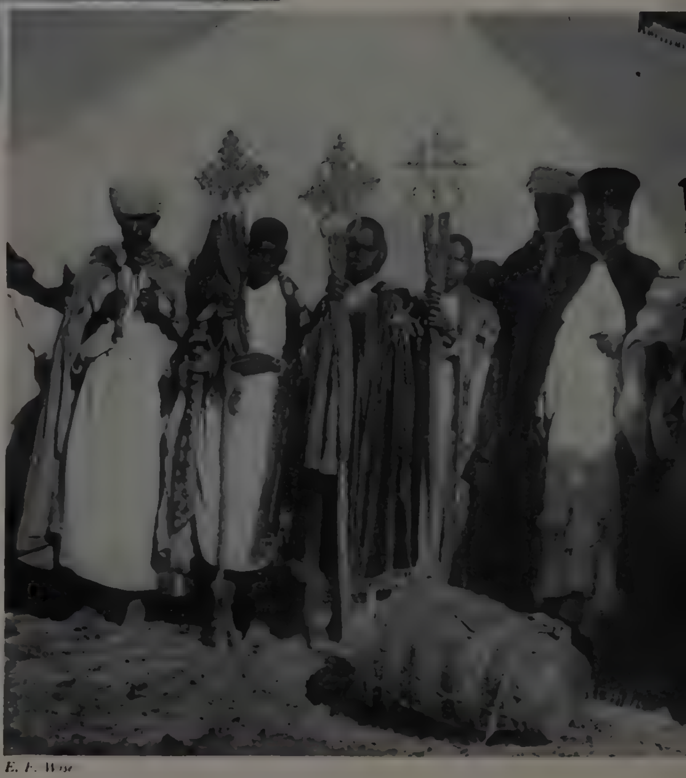
The railway above the clouds; while the Eastern Lowlands are shrouded in rain, bright sunshine floods the high Plateau. (Above) *Major Collier (left), General Manager of the Eritrean Railways, shows his realm to a visitor.* (Below) *Most of the passengers travel fourth-class in open cattle-trucks, paying about two shillings for a trip of seventy miles. Eritreans greatly enjoy travelling and these Christian women are far less shy and stay-at-home than are their Muslim sisters*

Hans Leuenberger

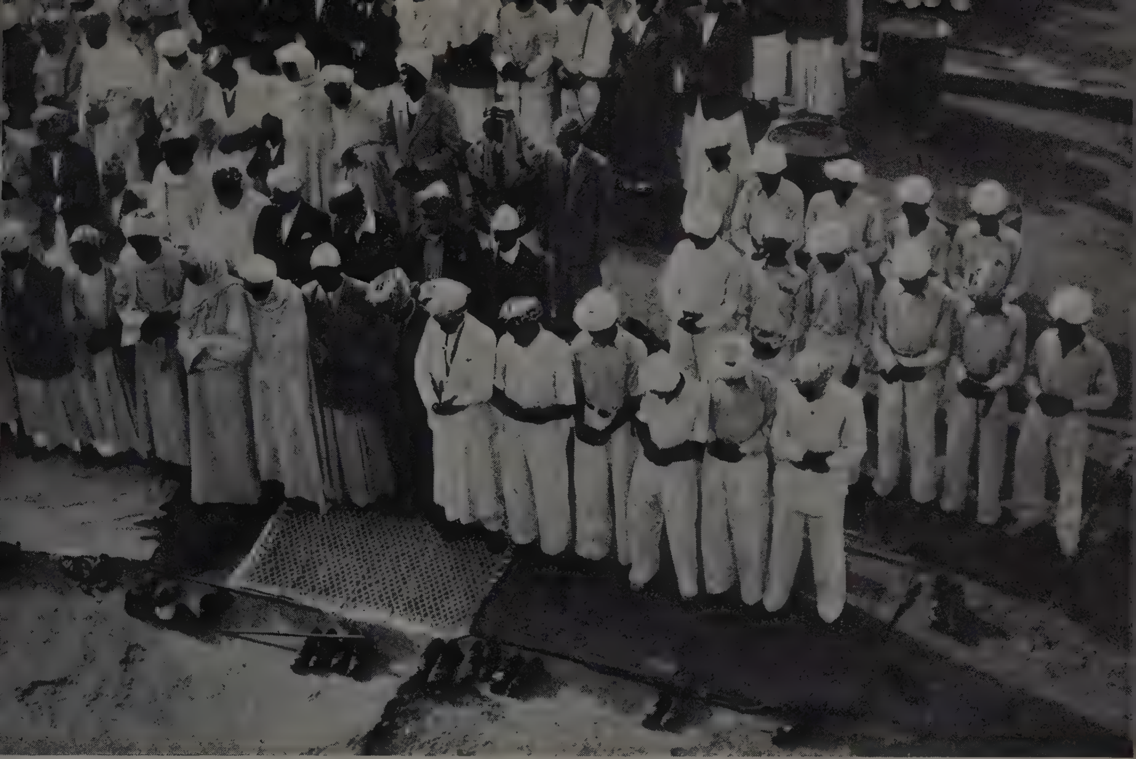
ns Leuenberger

About 25,000 Europeans and 55,000 Eritreans live in Asmara, capital of Eritrea and Headquarters of the British Administration. The European quarter is pure Italian, making no concessions to Africa; the Eritrean part includes a large market and a caravanserai. Besides a mosque Asmara has three cathedrals: Catholic of the Latin Rite, Catholic of the Ethiopian Rite and Copt. British and Italian cars and taxis fill the smart shopping streets; and restaurants, cafés and cinemas—and even two night clubs—are crowded every evening

A group of Coptic clergy on the Plateau. The Eritrean Abyssinians, like their Ethiopian kinsmen, have been Christians since the beginning of the 4th century A.D. *Copts are Monophysites; i.e., they deny the Human Nature of Christ. The greatest feast of their year is* Mesqel, *which commemorates the finding of the True Cross.* Qeshis, *or priests, clad in tawdry vestments, hold large processional crosses of debased silver. Senior clergy carry ceremonial umbrellas that resemble Victorian lamp-shades*



E. F. Wise



Hans Leuenberger

All Muslims and many Christians want the British Administration to stay but a vociferous minority, organized from Addis Ababa, demands union with Ethiopia. (Above) *Muslims at the Bairam Feast pray that their country may be spared annexation by Ethiopia.* (Below) *Copts at the Mesqel Feast demonstrate for Greater Ethiopia*

Keystone

E. F. Wise

Eritrean religious life centres round the Coptic monasteries. A fine mural at the Enda Abona Monastery depicting the Entry into Jerusalem. Even modern paintings show strong Byzantine influence

where the world seems to come to an end, and you suddenly realize with awe that the cloud above is solid rock. If there be a country at the top of that stupendous wall, it must be Beanstalk Land itself and surely no mere vehicle can find a way thither without wings. Yet the little coach performs the impossible. Bend after bend, tunnel by tunnel, it climbs doggedly up. At times you can see three levels of rails below you. Occasionally you catch your breath when the coach—now an aircraft on rails—seems to hang in blue space, the narrow viaduct beneath its wheels invisible to its passengers. As the afternoon air comes thin and chill to your nostrils, you reach gratefully for the pullover which, though unbelieving of the advice tendered in Massawa, you have obediently kept handy.

This is indeed the top of the world; green and gold during these summer months of the Big Rains, it lies smiling in the sun. There is little time to look round. Eucalyptus groves wave above you for only a few minutes before your coach lands you in Asmara station.

Asmara, oh Asmara, tenderly remembered by British and Italians alike as the miracle of East Africa. Clean, tidy, tree-lined streets; gardens gay with hibiscus and jacaranda; Italian shops not unworthy of the Via Condotti in Rome; cafés, with tables set out on the pavements under striped awnings, which could compete with Florian's in Venice; restaurants as good as Biffi's in Milan; women whose dress and make-up might grace any Italian fashion parade.

Here, especially in the great market-place in the Eritrean quarter, you meet for the first time the Abyssinians of the Plateau. Men go bare-headed. Over the shoulders of their white garments is draped the *futa*, a large white shawl of homespun cotton. Women wear the futa over their heads, not unlike the Indian *sari*, above ankle-length Kate Greenaway frocks mostly in gay prints. Married women wear their hair in tiny parallel plaits close to the skull, with a soft bunch of combed-out hair resting on the napes of their necks. Virgins have the sides of their heads shaven. All have the square Coptic cross tattooed on their foreheads.

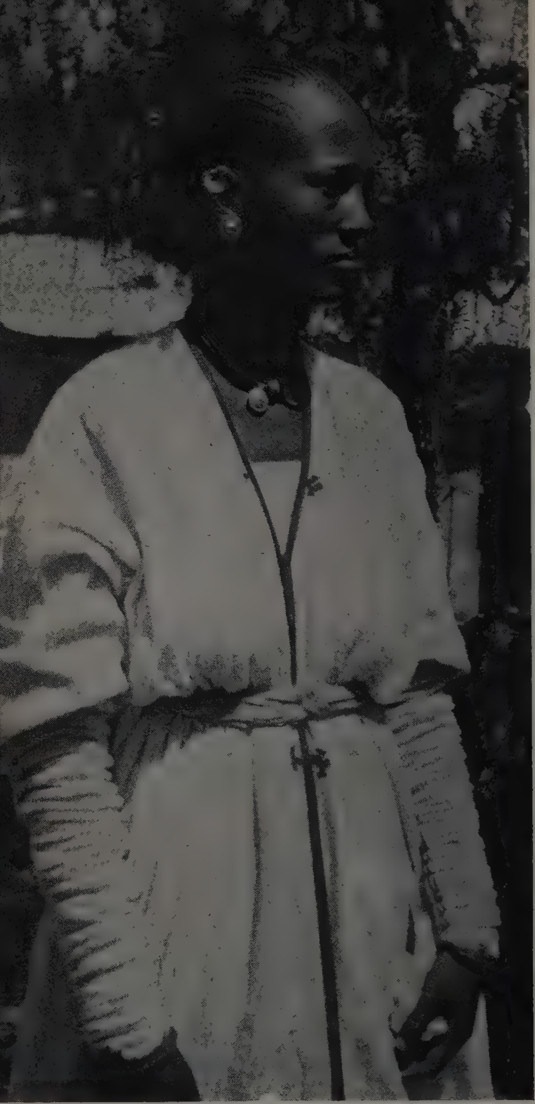
Though the Italians referred to them contemptuously as "blacks", do not for a moment imagine this race as Negroes, or, for that matter, as primitive folk. They are a courtly Semitic people, heirs to a culture that harks back to the ancient Empire of Aksum. Their skin varies in colour between honey and dark walnut. They speak Tigrinya, which is also the language of their kinsfolk in the Ethiopian Tigrai. Though it shares the same picturesque script as the Amharic tongue of Ethiopia, Tigrinya is different and more complex.

Now, if you want a glimpse of the real Abyssinian world, you must leave Asmara and the railway and travel south by one of the two Italian-built trunk roads. Here, in this land which has been Christian for fifteen centuries, you forget the Muslim Lowlands. Gone are the beehive huts and the ugly little red-garbed women with nose-rings. Villages up here are perched on hilltops, the houses—each flat turf roof a tiny grazing ground in the Rains—clustered round the Copt church crowned with its elaborately carved cross. The faithful are summoned to worship by the musical note of stone bells hung in the euphorbia trees surrounding the church. The *qeshi*—the bearded Copt parish priest with his white headgear, carved hand-cross and black horsehair fly-whisk—is accorded a measure of honour and respect to which, by European standards, his usual lack of literacy and his often unsaintly character scarcely entitle him. But the influence of the Coptic Church can hardly be overrated. It emanates from the monasteries, which are not so much seats of learning as heirs to a tradition of austerity dating back to the Desert Fathers of Egypt. The church imposes long and strenuous fasts, totalling more than half the days of the year, during which not only meat but eggs, milk and butter are forbidden. Moreover, the number of holy days on which no labour is permitted leaves only about a hundred days during the year for the tilling of the fields.

The Plateau is fertile and from June to September the varying greens of taff, dhurra and maize fields make a vivid background for the gold of rape and the blue of linseed crops. Land is scarce and precious and it is one of the blots on Italian colonial policy that so much of the best land was expropriated for the benefit of Italian settlers. Most fields are held either as strictly entailed freehold, as clan or as village commonage. Hotly contested land disputes, lasting for generations, are still heard under Customary Law.

E. F. Wise

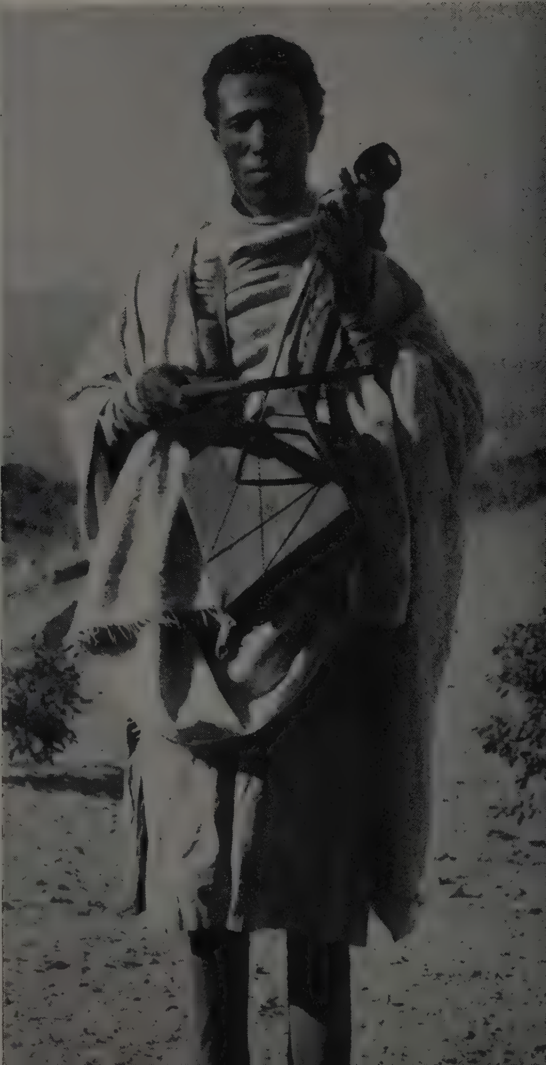
Markets play an important part in Eritrean life. Ethiopians come across the border to Adi Quala market to barter ass-loads of millet and taff for salt, cotton-stuff and other Eritrean commodities



Eritrean Abyssinians are a handsome race. Tebeletz Weldegiorgis, a young noblewoman, is wearing gold ornaments and the Eritrean lady's usual long white dress of homespun cotton embroidered in colour with traditional designs. It was as a token of personal friendship for the author's wife that she consented to be photographed without a futa *(shawl). Tebeletz understands, but does not speak, Italian*

E. F. Wise

E. F. Wi



A minstrel in the suite of Dejjatch Kahsai Teferi, Chief of the remote Qohain District. His master dwells in a castle with mullioned windows and has several hundred retainers. This minstrel has but one job—the improvisation of ballads at his master's banquets. He accompanies himself on the one-stringed, diamond-shaped fiddle of raw-hide slung round his neck; his tunes are nasal and monotonous

Hans Leuenberger

A stream, in Eritrea's Western Lowlands, lined with dum palms; these yield nuts which are made into vegetable-ivory buttons or a pernicious spirit that, suitably flavoured, is sold as 'whisky', 'cognac' or 'gin'

Here in the south, the great District Chiefs still live in the barbaric splendour of their forebears. There are two Rases among them and many who hold the proud title of Dejjatch or Azmatch. Though daily meals are frugal, banquets are gargantuan. Seven to nine highly spiced meat courses can be hard on a European digestion in the blazing noonday heat, even when they are washed down with *tedj*, the delicious fragrant mead brewed from honey and wild herbs.

The racial and cultural unity of the Eritrean Abyssinians with those of the Ethiopian Tigrai is often overstressed, especially by Ethiopian propagandists. The nearer you come to the Ethiopian frontier the stronger is the anti-Ethiopian feeling among the country-folk. The actual frontier of Ethiopia is the broad sandy bed of the River Mereb. It is difficult for Europeans to obtain permission to cross it. And there is little to be seen beyond except that the road, in good repair on the Eritrean side, is falling into ruin from neglect and that the people across the border betray, by their rags and the wretchedness of their hovels, a poverty unknown in Eritrea.

After one night in the luxury of the Asmara hotel, you take the early morning diesel coach down to the Western Lowlands. The first two hours of the journey are still through the familiar setting of the Plateau but here to the north the country is more broken and less fertile. Then the coach plunges down a steep valley, a dry rocky river-bed at the bottom with waterholes dug in its sand to supply villages on the crest. At the 3000-foot level, the land flattens out into a green valley. Here are some of the finest Italian fruit and dairy farms, with comfortable homesteads among the banana and pawpaw groves. A flash of dazzling purple bougainvillea hedges and of sisal plantations, a few miles of camel thorn and huge fat baobab trees, their arms twisted in agony, and the coach draws into Keren, perhaps the most charming of the towns of Eritrea, set in a wide amphitheatre among the mountains.

Keren: do you remember that name? If you served in 1941 with the Camerons or the Highland Light Infantry, it must be unforgettable. Three months the battle raged in that savage gorge and on the knife-edge ridges. Our victory at Keren ended Italian rule in Eritrea. It is impossible to go down through Keren gorge and see, painted upon a rock, the words, SCOTLAND FOR EVER, without being filled with awe and admiration for the men who fought their way up here.

At Keren, the scene has changed again. Once more you are in Muslim country, Tigrè-speaking this time. Leaving the battlefield behind, you travel along a sandy valley several miles wide. A camel sways in front of a wooden plough. This is the country of the proud Bani Amer tribe of camel breeders. Their herdsmen pasture camels or goats under the thorn trees, spear in hand, in all the glory of their elaborate fuzzy-wuzzy hair-do.

Now the rugged mountains fall back to the south in incredible cockscomb crests, like the backcloth for some fantastic ballet. You arrive in Agordat. The little market town, centre and hub of the Bani Amer country, swelters all the year round in a temperature of over 100° F., only the ratio of humidity changing with the season. Just now it is high and the place is exhausting. The large market square is piled high with sacks and baskets of grain and crates of eggs and clamorous with other crates of undersized fowls. Camels, loaded and unloaded, openly despise you as you pass.

Farewell now to the gallant diesel coach, for the Eritrean Railway ends here. But there is a reasonably good bus service to take you ninety miles further west. Barentù, the next little market town, is very attractive. It stands upon a low hill set in a wide valley. Here, Kunama country to the south meets the northern Baria country and the market-place is peopled by both types. The Kunama are the most primitive of the eight races of Eritrea. They are pagans of Nilotic origin and their men go almost naked, armed with clubs or short spears. They are rather shy and timid, which is hardly surprising if you remember that they suffered for centuries from Ethiopian slave-raiding expeditions—a fate which they shared with their hereditary enemies, the Muslim Baria to the north.

Beyond Barentù the country settles down to its western frontier pattern: that of the Sudan. Here are wide river-beds in flat valleys, their banks fringed with dum palms, under which scamper troops of rosy-bottomed baboons while jade green, long-tailed parrakeets flash among the malachite leaves.

Then the bus is engulfed in a sea of brown beehive huts of reeds, in reed-fenced compounds. This is Tessenei. The people in streets and market-place are black Nubians. Cranes land clumsily on their nests in the thorn trees.

Albeit still thirty miles inside Eritrean territory, Tessenei is now the terminus of the Sudan Railways. A cream-coloured train waits to take you through the cotton fields to the frontier station of Kassala and thence to Khartoum.

The Cairngorms as a National Park

by V. A. FIRSOFF

Mr Firsoff's latest book The Cairngorms on Foot and Ski *is to be published shortly by Robert Hale*

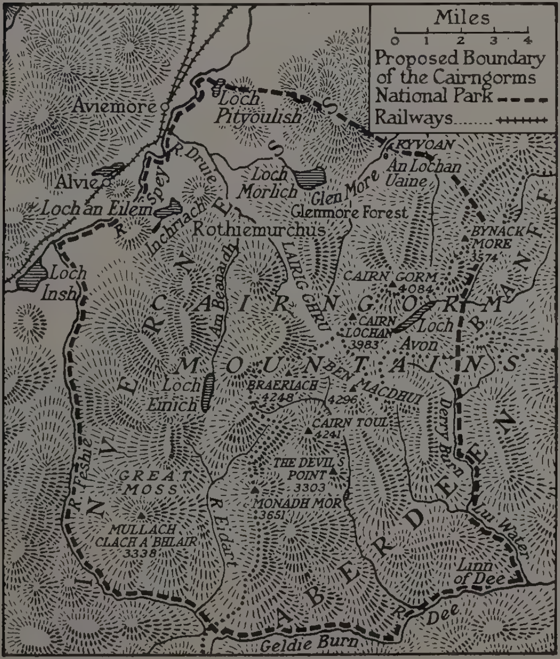
Britain is a crowded island in a crowded and shrinking world, where housing estates, metalled roads, railways, aerodromes and "dark satanic mills" are treading on each other's heels. They do, no doubt, bring comfort but they do not bring health, either physical or mental, and man pines for fresh air, unspoiled forest, the solitude and silence of the hills, the sight of wild animals moving freely over moor and crag—the lost birthright he has so often wantonly destroyed with his own hands. In England it is not easy to carve out a large area for a National Park to satisfy this modern craving, but Scotland is fortunate in her Highlands where scenic beauty combines with low economic value of the land.

In January 1944 a Scottish National Parks Survey Committee was appointed to investigate the situation and make suitable recommendations. A year later, having completed its task, the Committee issued a report wherein five areas were selected for National Parks, one of them in the Cairngorm Mountains.

The Cairngorms are a wide and wild, almost uninhabited, stretch of country about the meeting point of the counties Aberdeen, Inverness and Banff. The total area of the massif—it is not a range—is, taking in the adjacent lowland, about 300 square miles, half of which exceeds 2000 feet in altitude, with many summits over 3000 feet in height and four over 4000: Ben Macdhui, Braeriach, Cairn Toul and Cairn Gorm, all within the 180 square miles of the proposed Park. Ben Macdhui, it is true, is only the second highest mountain of Britain, falling 110 feet short in stature of Ben Nevis's 4406 feet, but the hill country surrounding the former is altogether more elevated, compact and isolated.

The Cairngorms are no exception among the British hills in being the ruins of an ancient tableland, broken up and partly destroyed by erosion. Yet nowhere else can the geologist read the story of their past so clearly, for large portions of the tableland still survive owing to the relative toughness of the granite rock of which these hills are moulded. As seen from the distance, their summits conform visually to one level, which tends to give their skyline a somewhat uninspiring appearance, unless the evening or morning sun brings out the massive power of the deep, crag-bound glens and the corrie cauldrons, with mural precipice, buttress, scree and tarn. The effect is particularly impressive in autumn when the colour scheme is a symphony of deep blues, purples and vivid browns, dipping into the sombre verdure of pinewoods and the old gold of birches.

Ridges are rare in the Cairngorms



A. J. Thornton

and there is only one proper *arête* within the Park area; the usual feature is an almost level upland, sloping gently in some directions and undercut by a gaping chasm in others. Some of the rock faces attain 1000 feet in height above the screes, and few scenes, even in the wild Highlands, can rival the gloomy grandeur of Braeriach's An Garbh (Rough Corrie) which Gaelic fancy has chosen for the abode of a 'She-Devil'. Yet the Cairngorms would be incomplete without their lochs, nearly all of which fall within the Park area. Loch Morlich in Glen More at the foot of Cairn Gorm and Cairn Lochan is the largest, being 300 acres in area and some 40 feet deep.

Not much, alas, remains of the proud Glenmore Forest that used to spread like a dark-green cushion at the foot of the brown giants, but some old pines still screen the loch and invade the wide beach of pink sand at its north-east end. Loch Einich in the west and Loch Avon in the east lie above the tree-line, in crag-rimmed glacial recesses, down into which the silver threads of foaming water and the pale rivers of reddish scree creep from the grey tops. The scenery of Loch an Eilein, among the wooded heights four miles from Aviemore, is different again. Early in the 13th century, the mighty Comyns, Lords of Badenoch, built on piles a castle (long since abandoned) on the small islet near the northern bank. Once an osprey used to nest on the ruin, but today only rooks remain. Pine and birch, bird-cherry and rowan, with a few larches and Douglas firs, ring the quiet waters; and Cairn Gorm presides distantly over the northward prospect.

Included within the Park area, is a sheltered lowland of glacial drift stretching from the northern foothills to the Spey. This is one of Scotland's most magnificent forest districts, though now but a mere shadow of its pre-war self. Apart from the approaches to Aviemore and the Forestry Commission plantings in Glen More and Inchriach, the forests are natural and descend in a direct line from the primaeval Wood of Caledon. On the west side its survivors straggle in patches along the clear stream of the Feshie and crowd into the crag-hemmed defile at the head of its glen. On Deeside the woods have largely escaped spoliation and both Glen Derry and Glen Lui still shelter fine stretches of natural pine stand.

The woodlands are the haunt of the roe, wild cat, fox, badger, as well as many species of birds. Beyond them the heaths, home of grouse and blue hare, rise up to about 3000 feet above sea-level, and there give way to the sub-arctic plateaux of the High Tops, where man has been only a passing visitor.

The Great Moss (Am Moine Mhòr) in the western Cairngorms is a wide expanse of tundra, providing summer grazing for the red deer. Higher still, on the 4000-foot deserts of Braeriach and Ben Macdhui, the dotterel, snow-bunting and ptarmigan breed; and the golden eagle, peregrine and kestrel, among other birds, may be seen.

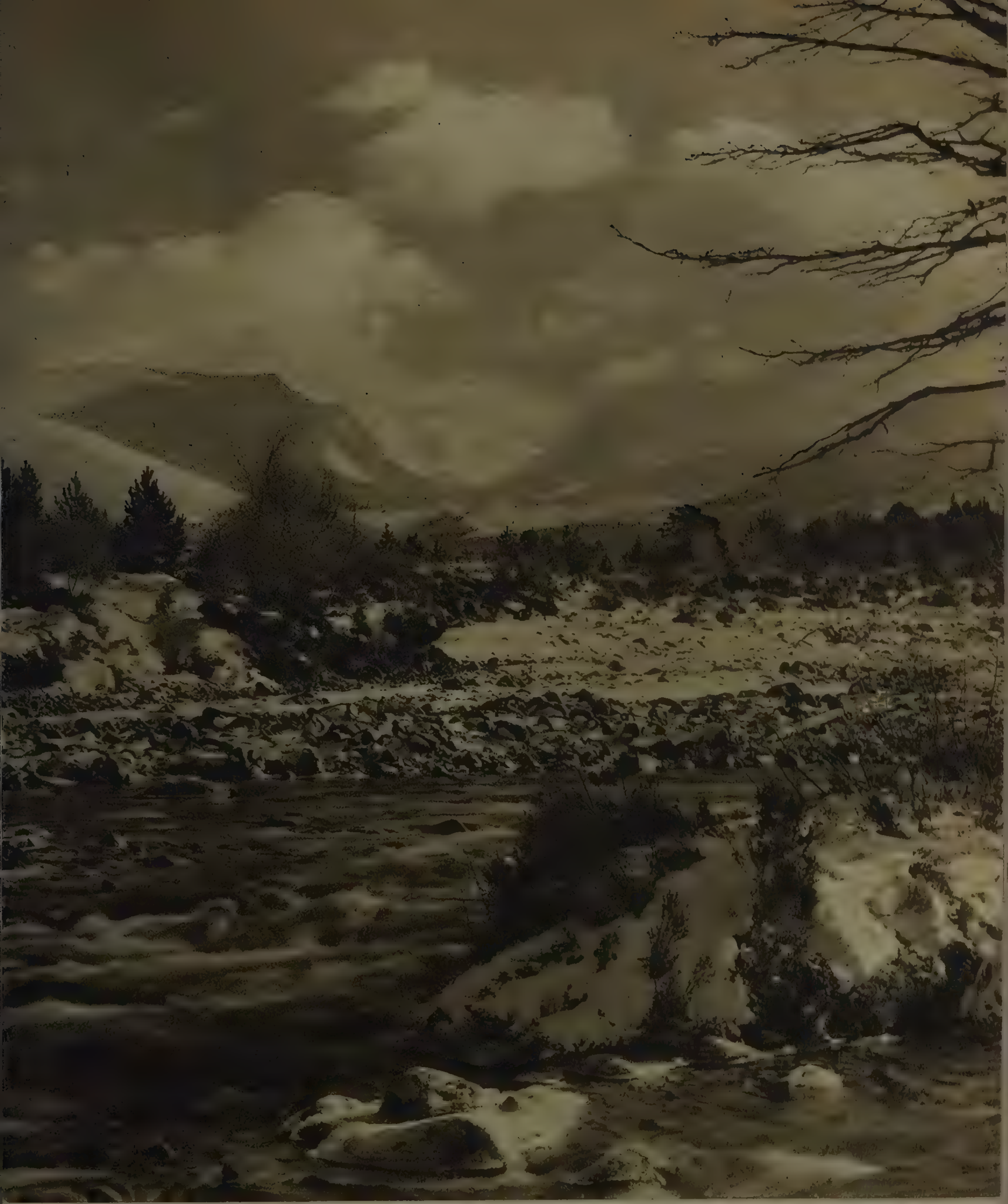
Bird-watcher, botanist and ecologist will find an interesting field of study among the varied zones of the High Cairngorms. Salmon, char and trout abound in their waters. And for those who like vigorous exercise there is a wide choice of crags to climb, though the coarse Cairngorm granite inclines to holdlessness and rotundity, while many routes are treacherous owing to loose debris. However, the buttresses of Coire Bhrochain in Braeriach are fairly sound and offer a variety of climbs over 600 feet and more of live rock. Winter precipitation varies, but there is usually enough snow for some ski-ing from the beginning of February to the second half of April and sometimes later; while the snow-packed gullies and the cornices of the corries provide ample opportunities for snow-climbing. Both these pursuits are steadily increasing in popularity, largely owing to the mountaineering school of the Central Council of Physical Recreation, now established at Glen More.

Last year the Forestry Commission created a National Forest Park in its Glenmore property, thus stealing a march on the national park proper, with which the former will be incorporated in due course as one of the cultivated areas with a special statute and restricted access.

The National Park is to be owned and controlled by the Nation, but, apart from the Nature Reserves, several of which are planned, the land is not to be closed to economic uses consistent with the object of the Park, such as rational forestry and agriculture.

Construction of foot and bridle paths is envisaged, as also is additional hostel accommodation, though nothing has so far been said about mountain shelters. The inflammable nature of the juniper-heaths and peaty subsoils necessitates control of camping; but two sites for campers are to be provided: one in Glen More, actually in existence, and the other in Rothiemurchus, in the fork of the rivers Druie and Am Beanaidh.

Although the report of the Survey Committee has been approved, the necessary legislation has not yet been introduced, so that some time must elapse before the Cairngorms National Park becomes a reality.



William S. Thomson

The approach from Rothiemurchus Forest to Lairig Ghru Pass in the Cairngorms, with the River Druie in the foreground. Before the last World War the forest surged to the foothills, reaching up the slopes 1800 feet above sea-level; but wartime fellings have left in it deep scars that will take many years to heal

Robert M. Adam

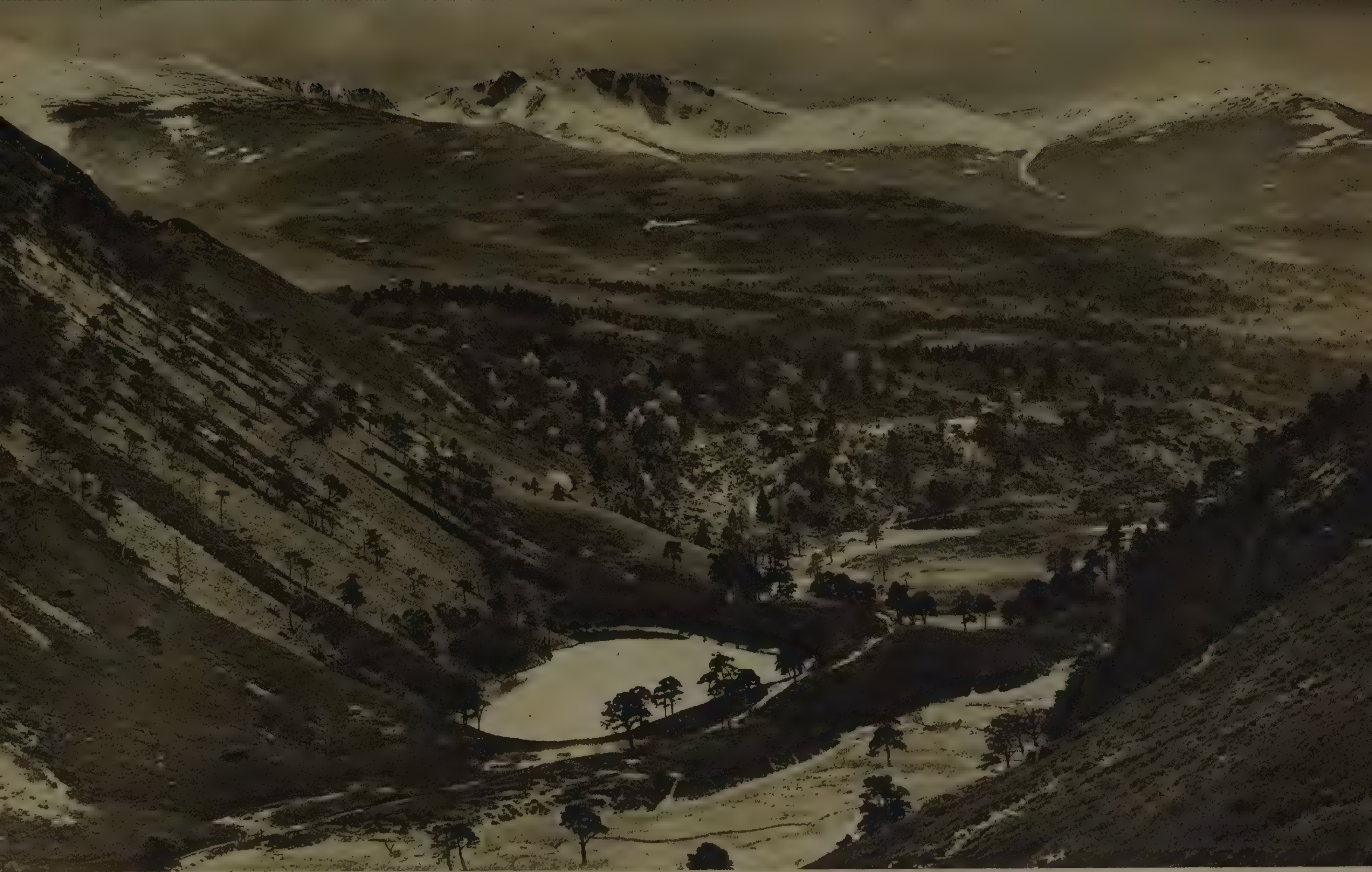
The Lairig Ghru cuts right through the Cairngorms, forming a route southward from Speyside. Once raiding parties of warring clans used this pass and cattle were driven along it to Aberdeenshire markets

Robert M. Adam

The mile-and-a-half wide An Garbh Choire (Rough Corrie) between Braeriach and Cairn Toul is the 'She-Devil's Lair' whose "grisly cliffs guard the infant rills of Highland Dee" that rise high on Braeriach

William S. Thoms

The north-west side of Braeriach: glaciers have long since disappeared from the Cairngorms but snowfields endure well into the summer



Robert M. Adam

The Pass of Ryvoan, with its Green Lochan, is the northern gateway to Glenmore National Forest Park, which was established last year

Robert M. Ad

Robert M. Adam

It is planned to establish a nature reserve in the wooded hills round Loch an Eilein, where old Caledonian firs still tower over the birches

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V. A. Firsoff

A Visit to the Southernmost Farmer in the World

by DR. GISÈLE FREUND

(Left) The captain of the Micalvi, *the Chilean ship that twice a year visits Tierra del Fuego. Sailing through the many narrow channels around Cape Horn requires constant attention from the captain and his officers for innumerable hidden rocks lie a few yards under these waters, known as the greatest cemetery of ships in the world*

All photographs by the author

In South America the seasons are upside down. When we in London are shivering with cold, it is summer down there.

The *porteños*, that is to say the inhabitants of Buenos Aires, who were in the capital on January 18, 1949, still remember that overpowering day. The temperature was 110°F. The heat was pouring down from the sky like fire, reducing every living thing to a state of torpid inertia. A wave of fire enveloped the whole city. People were seeking shelter in air-conditioned cinemas or hurrying to the public baths, as we packed our bags to set out for Tierra del Fuego—the Land of Fire. We were packing woollens, furs and high leather boots to protect us against the icy winds which sweep the channels round Cape Horn. We were preparing to face frightful cold; but at that moment great drops of sweat were running down our faces.

The information given us about that distant land was most contradictory. Ushuaia, the world's southernmost community, a former Argentine penal settlement, lies on the Beagle Channel some 1500 miles from Buenos Aires. People in the capital hardly know its name. It is like asking in London for details about the Sahara. The distances are about the same.

Since the publication of Charles Darwin's famous book, *A Naturalist's Voyage round the World*, a whole chapter of which is devoted to Tierra del Fuego, this country has had the reputation of a land accursed. Darwin described it as one of the most inhospitable regions in the world, inhabited only by cannibals living almost like animals; "a broken mass of wild rocks, lofty hills and useless forests, and these are viewed through mists and endless storms. The habitable land is reduced to the stones on the beach".

We disembark on February 6 at Punta Arenas, situated on the Straits of Magellan. It belongs to Chile. Until the day of the cutting of the Panama Canal Punta Arenas had a considerable part to play, because up to then the Straits of Magellan, so named after their discoverer, were the only sea route linking the Atlantic with the Pacific. Punta Arenas is to be our starting point. We are about to see Tierra del Fuego for the first time. Our imagination, helped by its suggestive name, leads us to expect a land covered with a red halo, although we know that Magellan, when he discovered it, gave it this name because of the innumerable fires kept

(Above) *On the north side of the Beagle Channel lies Ushuaia, once famed as the Argentine penal colony whence no-one could escape, for to the south was 'the end of the world', and on the other side the impenetrable Andes.* (Below) *A group of little islands in the Cape Horn area—usually the scene of violent winds and raging storms*

alight by the Indians in their boats scattered about the various channels which penetrate and surround this island. What we see across the Straits about eight miles away is a strip of land, long and black.

Weeks pass before we are able to take ship for the channels of the Land of Fire. There is only a single Chilean ship of 300 tons which makes the passage twice a year in order to provision the lighthouses and collect the bales of wool which come off the few *estancias* to be found in these parts. At last one afternoon at dusk we go on board. Our ship is called the *Micalvi*. A sort of recess in the hold without windows or water has been set aside for us. This is not a passenger ship. Here we are to live for several weeks.

The ship sails slowly through the narrow passages of the Fuegian archipelago. We have already been travelling for days through harsh and wild country. Virgin forest stretches along each bank and up the sides of mountains whose tops are everlastingly covered in snow. Sometimes glaciers, spread out like vast fans, transparently blue-green, reach down to the water. The sky is low and grey, and an icy wind blows all the time. A vast solitude hovers over this gloomy and mournful scene. It is difficult to believe that human beings can live in surroundings so hostile to man, where gales rage practically all the year round.

One of our ship's tasks is to land food and take on wool at the Estancia Piedra. This estancia is on Picton Island where lives the southernmost farmer in the world. Picton Island, together with Lennox Island and New Island, belongs to a little group of islands which are almost at the entrance to Beagle Channel at the end nearest to the Le Maire Straits and the Atlantic.

The *Micalvi* has already been cruising in these parts for three days without being able to come alongside the estancia which has not got a good harbour. The south-west wind is blowing with infernal strength and pierces us

A statue raised in Patagonia by the Spaniard, Menendez, to Ferdinand Magellan, who discovered this country in 1520 and after whom the Straits were named. Menendez was one of the first settlers in Patagonia; he came there as a poor man in 1870, introduced sheep-raising, and in less than twenty years had become a multi-millionaire to the marrow in spite of our three layers of wool, over which we have put a fur-lined sheepskin coat. The southern sun does not warm us.

On the bridge the captain is looking anxiously at the spray of the waves whipped up by gusts of wind. The fifteen sheep crowded forward in the ship huddle, frightened, against each other—they, and a few boxes of preserves, are all we have to eat. From time to time enormous waves break over the bleating beasts. The icy air is filled with the howling of the wind and the sound of the waves crashing against the rocks on the coast. We are in the Gulf of Nassau which separates Navarino Island from the archipelago of the Wollaston Islands further south.

Before nightfall we reach Puerto Toro, a natural harbour south-west of Picton Island. Here the ship is fairly well protected because the bay only opens to the north. The captain gives the order to keep the engines going all night and for the crew to remain at their stations as though the ship were under way. This precaution turns out to be justified because about five o'clock in the morning the boat begins to drift dangerously, carried along by the current. She has dragged her anchor.

The next day the wind continues to blow as strongly as ever; it is impossible to cross to the other side. The captain, perturbed by the night's doings, decides to take shelter in another and safer harbour which is on the other side of Picton Island. We sail close by the house of the estancia and suddenly we see coming towards us a frail vessel, a little cutter balanced perilously on the waves. It is Don Faustino Velasco, the *estanciero*, who wants to make contact with us at all cost and in spite of the bad weather.

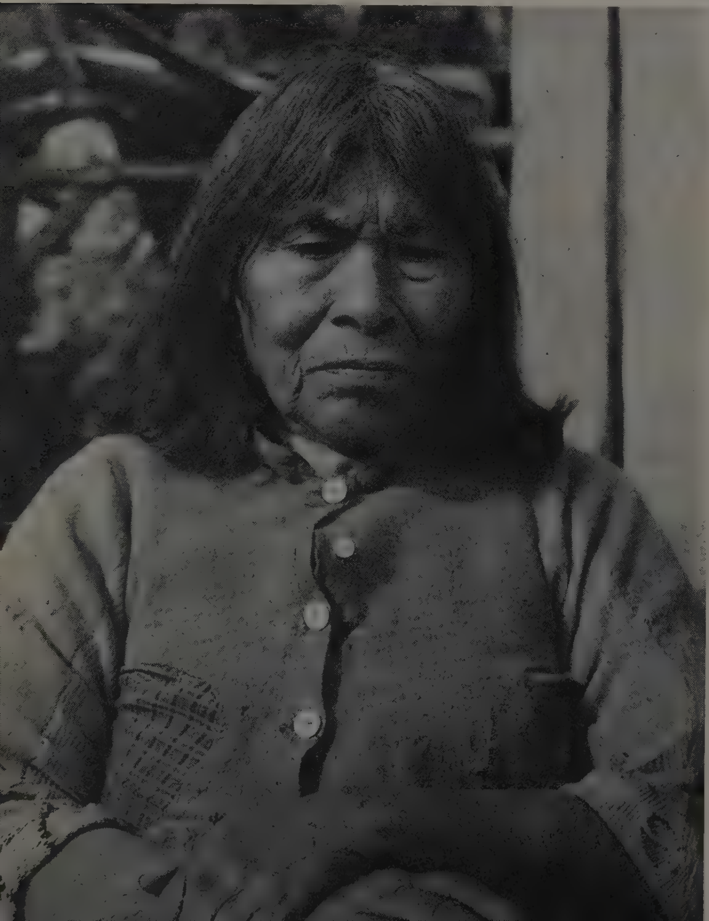
It is easy to imagine the extraordinary importance which the appearance of the *Micalvi* assumes in these distant latitudes. In theory she is supposed to pass this way twice a year, but this time it is nine months since her last visit because she had run aground in one of the channels of the Straits of Magellan. For Don Faustino and his family the ship's arrival is their only contact with the outside world; it means food, letters and speech with human beings.

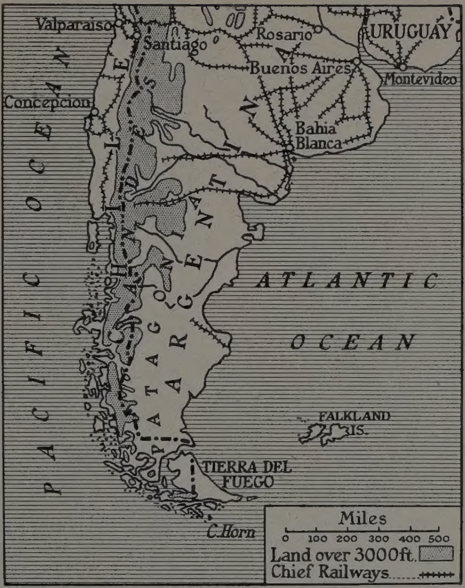
Don Faustino arrives on board. The captain greets him warmly and the whole crew flocks round him. He is a little fellow with a tough figure. He has a round head under a *béret basque* and small blue eyes which are always smiling. He knows nearly all the members of the crew and is liked by them because he never fails to give them several live sheep, which are a welcome addition to the ship's food stocks.

About ten o'clock we enter Beagle Channel. From the slopes of Tierra del Fuego stand out the silhouettes of wild, majestic, snow-capped mountains. They are the buttresses of the Cordillera of the Andes.

Now we have the wind

One of the last surviving Indians of the ancient Yagan tribe, of which only about sixty members remain today; they live on Navarino Island, eating mussels and fish caught in the channels





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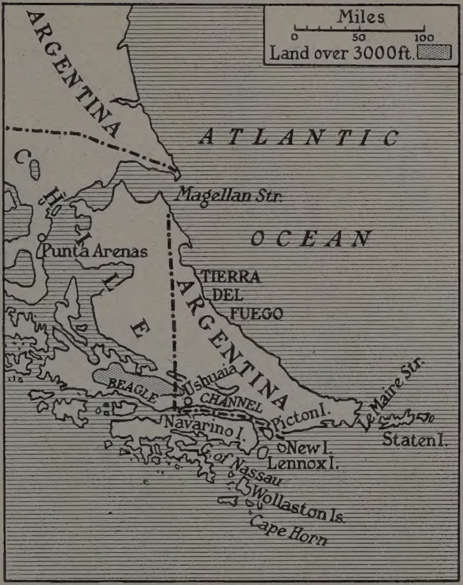


astern and the ship makes unaccustomed speed. About midday we sail into Banner Bay. It is the best harbour in these parts, thanks to a little peninsula which protects it from the wind. The *Micalvi* rocks gently on the calm waters of the bay. The water is transparent and reveals a labyrinth of sargasso stretching its speckled brown leaves over the surface. This sea-weed, extremely common in the Fuegian channels, has a round sticky stalk about a centimetre thick, but its length can be more than fifty yards. The stirring of the water makes it move like thousands of interlacing snakes. We try to pull one out of the water but fail. Later, on shore, we shall find some thrown up by the sea with, enmeshed in their stalks, stones so heavy that we cannot lift them. The strength of these plants is prodigious.

"We may well be here for quite a time", the captain tells Don Faustino on the bridge after reading the signal which the radio operator had just brought him, laconically worded: CYCLONE COMING FROM PACIFIC INVADING SOUTHERN AREA. "Look at the Beagle. It is covered with white foam, sure sign that the strength of the wind has not dropped. When shall I be able to come and fetch your wool and bring you your provisions? Tomorrow perhaps, perhaps not for a couple of days, who knows." And the captain gives a deep sigh. This is the first time that he is in command of a ship in southern waters among these dangerous narrow rocky channels, full of submarine currents. The weather seems to have no wish to make his task easy for him. "In that case", says Don Faustino, "I shall ask you to put me off here. I shall cross the island on foot. In four hours at the most I shall be at home. And if the ladies would like to come with me", he adds turning to the two of us, "it will give them a bit of a change from the *Micalvi*'s deck." I was thrilled by this proposal. Ever since the beginning of our journey I had been waiting for a chance to make a more thorough exploration of these islands, covered with apparently impenetrable forests composed of odd-shaped trees, misshapen by the wind.

Don Faustino explains to us in his slow, sedate voice that there is a small path which is in good condition at this season. "A horse is no use here", he says, "because it would quickly sink in the bog. We must start soon if we want to arrive before night. How pleased my wife will be! She does not often have guests." And his face lights up with a kindly smile.

It is already two o'clock in the afternoon and the southern days are short. We decide to start at once. A boat is lowered and takes all three of us ashore. Hardly have we touched land when we feel the icy wind lashing us mercilessly. Our adventure begins.

Don Faustino suggests that we should proceed in Indian file. "I shall go first and all you will have to do is follow me." The execution of this plan is soon proved difficult.

While Don Faustino Velasco, "the southernmost farmer in the world", is able to feed but 4500 sheep on the poor grazing land of Picton Island, Patagonia as a whole is an important sheep-raising area containing many millions of heads. Here a shepherd is shown guarding a flock belonging to descendants of the pioneer Menendez: they are now the biggest sheep-farmers in Patagonia with half a million on their principal estancia, *thus following in the footsteps of their enterprising ancestor who brought in the first sheep from England and built up a local breed renowned for its fine wool*

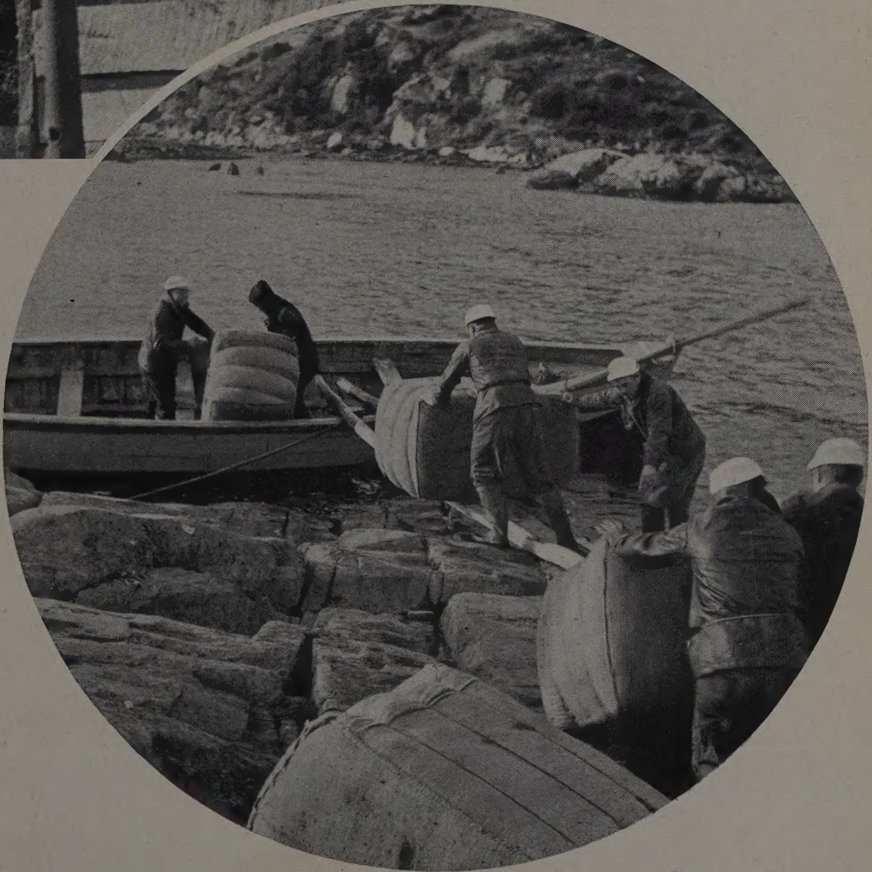
On leaving the shore we follow a channel in which the bay ends. We have to get round this in order to reach the mountain that we have to cross. At every step our feet sink deep into the ground. As we are wearing high rubber boots, they tend to stick in the mud. After walking less than a mile, in spite of the intense cold there are beads of sweat on our foreheads.

We enter the bottom of a valley. The boggy soil is covered with a moss which turns to water as soon as we put our feet on it. Here and there grow a few bits of grass and some small bushes. We follow a wire fence put up by Don Faustino to keep the sheep from being lost in this treacherous ground. On the whole of Picton Island he has built about thirty miles of wire fence, which is a remarkable piece of pioneer work when one thinks of the difficulties to be overcome. Thanks to a clever system of alternating the pastures on this land so poor in grass, he manages to feed about 4500 sheep on the whole island.

On the other side of the fence is an extraordinary forest. Comparatively well protected against the wind, the trees grow to a majestic size. We continue into the interior and we find ourselves in the shadows cast by the density and exuberance of the vegetation. We have to jump over huge fallen trunks and force a passage through branches which lash our faces; the ground is strewn with roots above the surface. To us this forest seems a hopeless labyrinth, but our guide has no hesitations. In the deep silence which reigns around us the only sound is the noise of our steps.

We leave the dense jungle and emerge into a clearing, marshy under foot. We splash

(Left) *Don Faustino checks the goods delivered to him with the commissary of the* Micalvi*; upon this ship the inhabitants of the lighthouses and few estancias of Tierra del Fuego depend for their provisions and mail.* (Below) *Members of the ship's crew transporting bales of wool to the boat which will carry them out to the* Micalvi. *Don Faustino is sending off nine months' production (usually the ship arrives bi-annually, but this time it was delayed) from his estancia to be sold in the Chilean town of Punta Arenas*



through the water. The air is full of dampness. It is almost hot. Funnily enough, we have a feeling as though we are in the tropics. On emerging we reach the foot of an extremely steep slope, covered with huge oaks. This is the beginning of the famous path which Don Faustino had mentioned on board. It is a stiff climb and no mistake; we have to hoist ourselves up step by step. Tree-trunks and roots serve as grips for our hands to catch hold of, while our feet seek desperately for support in the soil which seems to want to escape from beneath us. To left and right of our route we see on the ground strawberries covered with little green leaves. They are delicious and refresh our parched throats.

At last we reach the top. As soon as we have left the last trees behind, we are once more exposed to the wind which suddenly dries the sweat with which our bodies are covered. It is like a cold shower after a Turkish bath. We are on a high plateau which crowns the whole island. A magnificent panorama is spread out before our eyes. In every direction we see dozens of small islands, separated by innumerable channels. The islands are intersected by valleys and partly covered with extremely thick forest. Picton Island is dotted with many lagoons. To the north the outline of the *Micalvi*, anchored in Banner Bay, looks like a toy. Far away we can make out Beagle Channel, a blue ribbon round the edge of this labyrinth of isles and water. New Island and Lennox Island stand out to the south.

Don Faustino had promised us that once we reached the top the going would be easy, but it is boggy on the plateau too. The ground is covered with very rough grasses and shrubs. Don Faustino sets fire to some weeds whose ashes will revive the earth. The smoke will warn his wife of our approach. In these parts it takes the place of the telegraph.

We do not see the outlines of the estancia until seven o'clock in the evening, when the night is well advanced. Large drops of rain are beginning to fall as we reach the house. It is made wholly of wood. Don Faustino's wife makes us heartily welcome. She embraces us as if she had always known us. She is a short, plumpish woman of about forty with a pretty Spanish head. Soon we are all gathered round the traditional *cazuela de ave*, a chicken broth with rice. It is pleasantly warm near the stove, round which our soaking woollen stockings are drying, while outside the gale begins to rage. Tonight we sleep beneath the roof of the southernmost farmer in the world.

The next day at about eight we wake with a start. We hear shouting; the whole house seems to be in an uproar. Don Faustino's wife rushes into our bedroom. She is so excited that she can hardly speak. She points to the window. We rush to it. There in the mist, dancing on the foam of the waves, is the outline of a phantom ship. It is the *Micalvi*. But hardly has it appeared when it turns about and vanishes at once, unable to come nearer. Towards ten we witness a second attempt to approach the shore. This time the anchor is successfully dropped and a boat pushes off with some of the crew. They work until nightfall. It is very hard work. Each journey by the little boat is a hard struggle between man and the elements. The sailors have to remove the bales of wool, each weighing between 450 and 550 lb., from a shed by the water's edge and then load them in the boat. Once loaded, the men take the boat alongside the *Micalvi* which is anchored between two rocks. Don Faustino watches the loading with an anxious expression. The yield of nearly a year's difficult toil depends on the skill of the men in the boat.

Meanwhile we are seeing round the house. Don Faustino's wife proudly shows us her kitchen garden where she grows potatoes, cabbages and salads. These few greens have an inestimable value here. Round the garden is a wall made of wooden planks to protect the plants against the wind which never stops blowing with terrible violence. In front of the house there are some daisies which are in full flower at the moment. We visit the farm buildings. The farm provides work for five agricultural labourers. The *Micalvi's* arrival brings them tobacco. They smoked their last cigarette more than two months ago. Don Faustino's wife talks volubly. It is such a long time since she had any strangers to talk to. But thanks to the wireless she knows what is going on in the world.

Towards six we leave our hosts to go on board again. The captain has already sent a messenger to ask us to hurry. The weather is so uncertain that he may be forced to raise anchor from one minute to another.

On board all the members of the crew are at their stations. The officers are shouting orders. The captain is anxiously pacing the bridge. He never takes his eyes off the rocky shore. His eyes have dark circles round them. He admits to us that he has had no sleep for twenty-four hours. On him is the whole responsibility for the ship and he is full of solicitude for his men. As soon as the loading is finished, the anchor is weighed. We take a last look at Picton Island which is soon lost in the mist, and we go on our way through the Fuegian channels.